

**Symphonica** 

# **AI-Driven, No-Code OSS: An Essential Upgrade Towards Autonomous Networks**



Release 1

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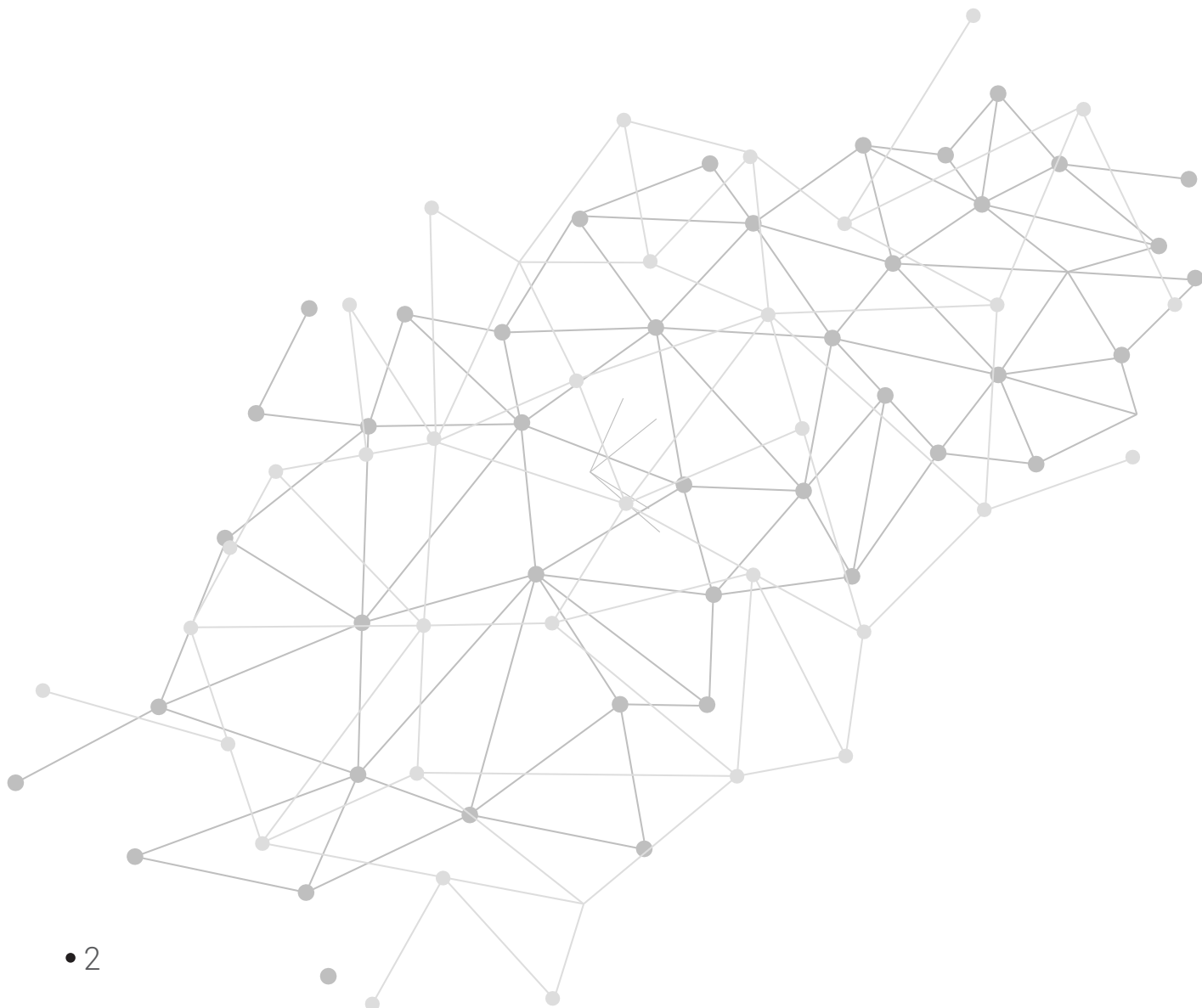
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# AI-Driven, No-Code OSS: An Essential Upgrade Towards Autonomous Networks

*This white paper dives into the OSS transformations required to achieve high-level autonomous networks, highlighting an essential transition towards AI-driven, no-code, and cloud-native telecom orchestration and activation systems. This shift is not merely technological but a strategic imperative for telecom operators to remain competitive in an ever-evolving digital landscape.*

*Anticipating a significant departure from traditional systems, this paper not only explains the rationale for these requirements but also details advanced features already available in Symphonica, a pioneer in the next generation of OSS. It includes a comprehensive examination of AI utilization during the design, runtime, and post-order execution phases.*

*Furthermore, this paper introduces an innovative dual-agent approach to self-optimization, which clearly separates the 'black box' from the control system of the network, helping address prevailing trust concerns by improving efficiency and transparency in automated network operations.*

## **The Next-Gen OSS: AI, No-Code, and Cloud-Native**

Forward-looking, cloud-native Operations Support Systems (OSS) are meticulously crafted to facilitate the journey to autonomous deployment and management of telecom services, allowing emerging and established CSPs to rapidly grasp the benefits of scalable machine-learning platforms that are not available in traditional on-prem IT environments.

Next-gen cloud-native OSS enables the use of AI to manage dynamic, containerized, and distributed network functions effectively. Facilitating AIOps, self-X, and zero-touch operations, these pioneering cloud-native OSS are catapulting telecom networks into unprecedented levels of intelligence and efficiency, essential to the realization of fully autonomous networks.

No-code, AI-first OSS platforms, exemplified by Symphonica, democratize network management by empowering a broader spectrum of professionals –with no coding experience– to perform a complete configuration and deployment of these new solutions, drastically reducing the time and effort required to adopt the new technology and realize its economic benefits.

## Autonomous Networks and AI

With self-managing, self-optimizing, and self-healing capabilities, Autonomous Networks represent the future of telecommunications. These networks, underpinned by intelligent systems, can make decisions and execute actions autonomously, drastically reducing the need for human intervention. This evolution towards more intelligent, autonomous networks is not just a technological leap but a strategic imperative for Communication Service Providers (CSPs) to stay competitive.

At the heart of the Autonomous Network lies Artificial Intelligence. AI-driven OSSs are instrumental in transforming traditional, manually-driven network management into an automated, proactive, and predictive model. By harnessing this new generation of operational support systems, operators can process vast amounts of data, identify and react to patterns, predict potential issues, and optimize performance automatically. This continuous learning and adaptation enables networks to improve their operations and responsiveness, effectively catering to dynamic network environments.

For CSPs, transitioning to an AI-driven OSS is crucial to allow for heightened efficiency and cost-effectiveness by completely automating routine operations and decision-making. This shift not only enhances customer experiences through more reliable and consistent service delivery but also fosters agility and scalability in network operations.

Further, as the market becomes increasingly competitive, CSPs equipped with AI-driven OSS and Autonomous Networks can stay ahead by offering innovative services, responding swiftly to market changes, and maintaining superior service quality at a lower cost. Embracing this technological evolution positions CSPs to meet the growing demands of the digital future with confidence and to take business from those who don't.

In essence, Autonomous Networks, empowered by AI-driven OSSs, are essential for CSPs to achieve business growth, cost cutting, operational efficiency, and digitalization of operations, but also a larger long-term strategy for business diversification.<sup>1</sup>

## CSPs Progress Towards Autonomous Networks

The path to achieving fully autonomous networks is charted through TM Forum's six-level maturity model<sup>2</sup> of network automation. As of the beginning of 2024, the majority of CSPs are functioning primarily at Levels 1 or 2 across various network domains. However, a shift is underway, with some front-runners advancing to Level 3. The industry as a whole is looking up for a significant

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<sup>1</sup> Report. *Autonomous networks: from concept to reality*. TM Forum, 2023.  
<https://inform.tmforum.org/research-and-analysis/reports/autonomous-networks-from-concept-to-reality>

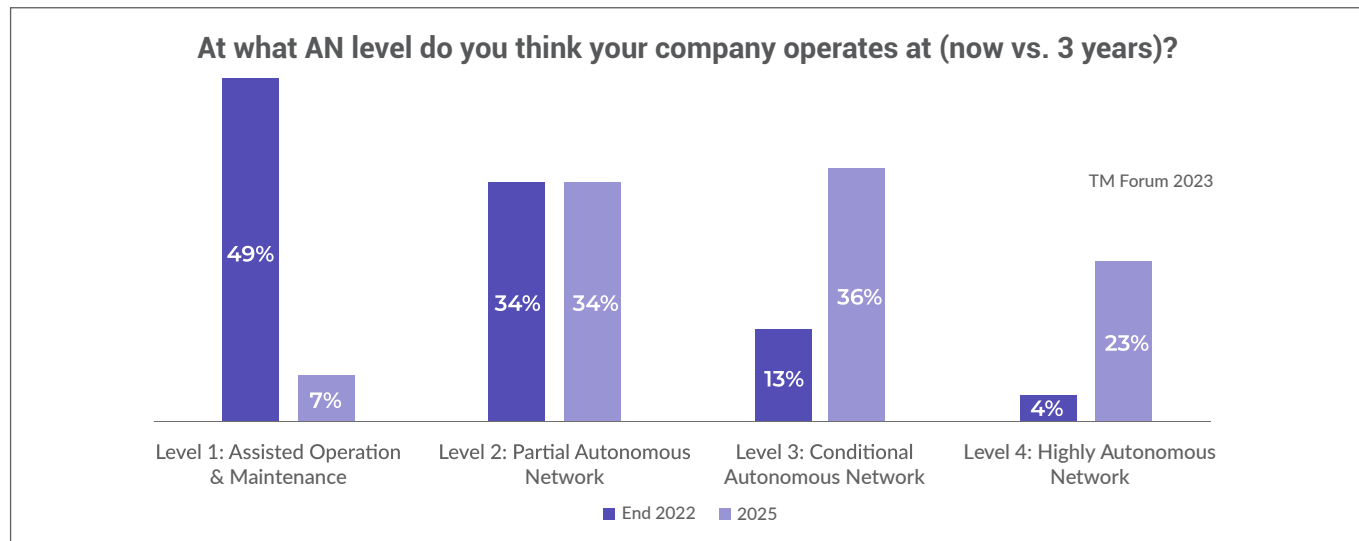
<sup>2</sup> Report. *Leveling Up: Achieving Level 3 Autonomous Networks and Beyond*. TM Forum, 2023.  
<https://inform.tmforum.org/research-and-analysis/reports/leveling-up-achieving-level-3-autonomous-networks-and-beyond>

leap towards Level 4. Projections for 2025 indicate that nearly 60% of CSPs aim to be operating at Level 3 or higher, with about a quarter striving to attain Level 4.

Autonomous Levels	L0 Manual Operation & Maintenance	L1 Assisted Operation & Maintenance	L2 Partial Autonomous Networks	L3 Conditional Autonomous Networks	L4 High Autonomous Networks	L5 Full Autonomous Networks
Execution	P	P/S	S	S	S	S
Awareness	P	P/S	P/S	S	S	S
Analysis	P	P	P/S	P/S	S	S
Decision	P	P	P	P/S	S	S
Intent/ Experience	P	P	P	P	P/S	S
Applicability	N/A	Select scenarios				All scenarios
<div style="display: flex; justify-content: space-around;"> <span><span style="border: 1px solid black; padding: 2px;">P</span> People (manual)</span> <span><span style="border: 1px solid black; padding: 2px;">S</span> System (autonomous)</span> </div>						

**Table 1.** Autonomous Networks Levels (ANL), from *Autonomous Networks: Empowering Digital Transformation For the Telecoms Industry*<sup>3</sup> by TM Forum, 2019.

Several individual CSPs, including industry leaders like Orange, MTN, AIS, and notable Chinese operators, have set ambitious targets to reach Level 4 by 2025.<sup>4</sup> This collective momentum towards network autonomy reflects the strategic priorities of these major players, focusing on achieving agility and long-term autonomy in their operations.



**Figure 2.** How respondents envisage ANL in three years' time, from AN survey by TM Forum, 2023.

<sup>3</sup>White Paper. *Autonomous Networks: Empowering Digital Transformation For the Telecoms Industry*. TM Forum, 2019. <https://www.tmforum.org/wp-content/uploads/2019/05/22553-Autonomous-Networks-whitepaper.pdf>

<sup>4</sup>White Paper. *Autonomous Networks: Empowering Digital Transformation For the Telecoms Industry*. TM Forum, 2019. <https://www.tmforum.org/wp-content/uploads/2019/05/22553-Autonomous-Networks-whitepaper.pdf>

Mid-sized operators are not far behind in the race towards automation. Insights from a recent survey by Heavy Reading<sup>5</sup> highlight that network automation is perceived not just as a technological upgrade but as a critical factor for staying competitive and enhancing customer experience. An overwhelming 93% of Tier 2/3 CSPs are considering the adoption of network automation technologies.

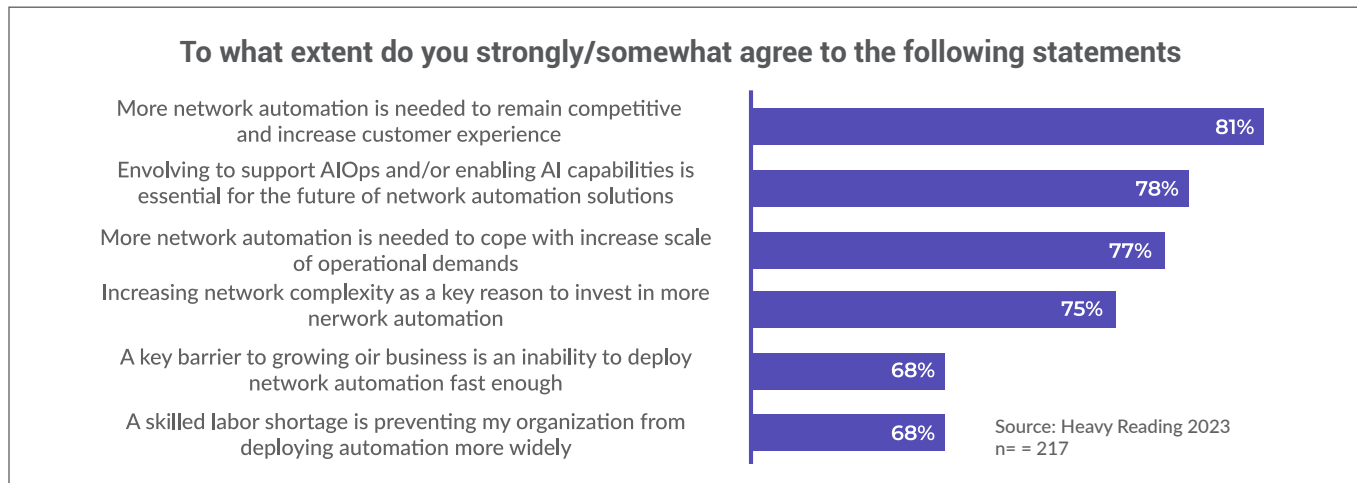


Figure 3. Network Automation for tier 2/3 service providers, from Heavy Reading, 2023.

Amidst these advancements, a core challenge emerges as a pivotal focus for the industry: the preparation and transition of operational support systems (OSS) to facilitate and support autonomous network operations. This challenge is highlighted in the “Leveling up: achieving Level 3 Autonomous Networks and Beyond” paper by the TM Forum<sup>6</sup>. The paper points out the significant challenges in the shift from conceptualizing to actual implementation of autonomous networks.

According to the TM Forum’s research, CSPs are starting with domain-specific automation and gradually expanding to cross-domain network automation, which can get a CSP to Level 2 and approaching Level 3. Getting to Level 4 requires a strategic rethinking of the entire operational frameworks and significant investment in new intelligent network elements, cloud-native OSS, and automation tools and processes.

Even towards achieving Level 3 ANs, the TM Forum’s survey found that CSPs are currently facing challenging workforce skill gaps, particularly in automation and AI. While attempting to reduce this crucial workforce shortage through strategic hiring, reskilling, and upskilling initiatives is a good start; a more efficient solution –demonstrated by the success of AWS SageMaker and OpenAI ChatGPT– is to radically decrease its complexity through no-code frameworks and more intuitive user interfaces.

<sup>5</sup>White Paper. *Network Automation for Tier 2/3 Service Providers: Heavy Reading Survey Analysis*. Heavy Reading, 2023. <https://go.juniper.net/c/sp-dc-whitepaper-1164174477-en?x=MyqB8Q&>

<sup>6</sup>Report. *Leveling Up: Achieving Level 3 Autonomous Networks and Beyond*. TM Forum, 2023. <https://inform.tmforum.org/research-and-analysis/reports/leveling-up-achieving-level-3-autonomous-networks-and-beyond>

Looking into Levels 4 and 5, Autonomous Networks introduce the concept of intent-based operations<sup>7</sup>, which aim to align network operations with the strategic objectives of the operator and the expectations of customers and users. Intent guides desired outcomes, leaving network design and operation to the platform's autonomous features.

Achieving the maximum benefits of intent requires the smart network AI model to be continuously updated with real-time data, including during order processing and when identifying specific trends or exceptional events.

Additionally, to allow the Autonomous Network AI model to understand, improve, and ultimately create new business process workflows, service workflows, and network connectors; orchestration and provisioning systems must utilize a machine-readable framework to expose them to the platform. No-code OSS, connectors –once known as cartridges– do not require programming, just plain configuration that is stored in a plain-text standard that machines can read, understand, update, and even create. In contrast to traditional OSSs that needed coding and compiling, modern no-code OSSs emerge as a crucial evolution requirement, necessary to allow AI models to readily access, build, and improve the definition and functionality of workflows and connectors.

Forward-looking CSPs are confronting this challenge head-on, recognizing that the successful transition to the next generation of OSSs is crucial for the realization of autonomous network operations.

The screenshot shows a web form with the following sections:

- Resource Vendor \***  
Who is the provider of the equipment or resource you are targeting?  
Choose a vendor from the list or add a new one.  
Dropdown menu: HUAWEI
- Product \***  
What is the Product you are integrating?  
Choose an existing product for the selected vendor, or or create a new one.  
Dropdown menu: H559860
- Software Version \***  
Which is the Software Version of the product you are integrating?  
Choose an existing version from the list or add a new one.  
Do not include minor versions when the integration specification does not change.  
Dropdown menu: V900R019C11
- Product Integration Documentation for this Version**  
Upload the product documentation that describes the integration interface to get AI-generated suggestions including parameters, actions, and more!. It will also come in handy when designing your connector and if you require customer support.  
Text input field: HUAWEI\_HSS\_9860\_V900R019C11.pdf  
Button: Upload Document

*Symphonica Next-Gen OSS uses GenAI to analyze network element product documentation and automatically create connectors that fit the selected Resource Specification template.*

<sup>7</sup>White Paper. *Intent-Driven Autonomous Networks: Paving the Way for the Future of Telecommunications*. Infracore, 2023. <https://www.infracore.com/blog/white-paper/intent-driven-autonomous-networks-paving-way-future-telecommunications>

## Enabling Autonomous Networks

Cloud-native solutions enable the efficient processing of vast Telecom network data, which was previously sitting in useless, uneasily calm data lakes. The scalability and elasticity of the cloud empower CSPs to utilize this information effectively for training the AI models needed for autonomous operations. Embracing the cloud is crucial in the journey towards autonomous networks.

No-code OSS platforms offer unparalleled simplicity and agility for developing and enhancing workflows and connectors, which is essential for achieving functional and cost-effective Level 3 autonomous networks and an absolute need for Intent, essential to achieve Levels 4 and 5. It is also paramount to drastically reduce the workforce skills gap between automation and AI.

Legacy operators face distinct challenges on their path to autonomous network operations. Their reliance on legacy OSS systems, developed incrementally over time, has resulted in operational stagnation. These systems, which cannot significantly reduce operational expenses, struggle to adapt to the rapidly changing demands of modern telecommunications<sup>8</sup>.

Unlike greenfield operators and a few pioneers that have already adopted cloud-first and AI-first approaches, brownfield operators contend with legacy vendors that are reluctant to truly embrace the cloud and no-code paradigms, fearing that doing so could jeopardize their historically lucrative professional services business models.

The shift to next-generation, cloud-native OSS solutions like Symphonica, with its unique no-code and standards-based approach, is not merely a technological upgrade but a strategic necessity for these operators to overcome legacy constraints, embrace real agility, and gain a competitive advantage over hyperscalers and emerging market players.

In summary, the new generation of truly cloud-native, no-code OSS solutions empowers both new and legacy CSPs to swiftly embrace the cloud. This facilitates seamless access to scalable machine-learning platforms and AI-enabled agile orchestration design, which are crucial to advance on their journey toward fully autonomous networks.

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<sup>8</sup>Blog. *Passionate About OSS*. Ryan Jeffery, 2023. (Accessed: 04 January 2024)  
<https://passionateaboutoss.com/closing-the-oss-buyer-seller-chasm-solutions-part-4/>



## Symphonica: Addressing Telecom Complexity

Symphonica emerges as a solution that seamlessly addresses the current landscape of telecom operations. This cloud-native, no-code platform provides automated activation, provisioning, orchestration, and autonomous assurance functions. It seamlessly bridges business systems to network infrastructure, facilitating real-time service activation through zero-touch automation. Symphonica's agility in integrating with any internal or external system with no-coding through multiple innovative and legacy protocols is noteworthy, delivering true end-to-end solutions with unparalleled speed and efficiency.

### Core Functionalities of Symphonica

Symphonica excels in advanced telecom operations through its core functionalities, including Resource Orchestration, Service Assurance, Automated Service Lifecycle Management, and Security. Each of these functionalities contributes to a future-ready network infrastructure, strongly leveraging AI across every use case.

#### No-Code Orchestration and Connector Design Capabilities

Symphonica's intuitive, graphical, end-to-end no-code orchestration, Workflow and Connector Design Studios enable seamless integration with any network elements, cloud services, and third-party systems, through multiple protocols, radically accelerating service design and ensuring compatibility across new and legacy technologies.

#### Multi-Vendor, Multi-Technology Service Orchestration

The platform offers robust orchestration capabilities across multiple network technologies and vendors, facilitating efficient management of complex, multi-vendor network environments. It also provides absolute flexibility to create and update connectors with no-coding skills, enabling rapid adaptation to market demands and technological advancements.

#### Cloud-Native and Scalable Architecture

Symphonica's cloud-native design ensures scalability, flexibility, and high availability. Its micro-services-based architecture and open APIs support a modern, agile infrastructure adaptable to changing network demands. The connector handlers, responsible for executing the different protocols, are designed with network security, high-performance, and high-scalability features in mind, such as throttling, prioritization, parallel processing, and the ability to keep open connections, among other important but not-so-common capabilities.

#### TM Forum-Based Standards Compliance

A key feature of Symphonica is its compliance with TM Forum's Open Digital Architecture<sup>9</sup>, ensuring that the platform adheres to globally recognized best practices in service management and orches-

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<sup>9</sup>Web Page. *Open Digital Architecture (ODA)*. TM Forum, 2023.(Accessed: 04 January 2024)  
<https://www.tmforum.org/oda/>

tration. This compliance facilitates seamless integration with existing systems, promotes interoperability, and ensures a consistent approach to service lifecycle management –for all the different services– in line with industry norms.

### Automated Service Activation and Monitoring

Facilitates zero-touch provisioning and orchestration of network services, reducing manual intervention and enhancing operational efficiency. It includes real-time monitoring and management for AI-enhanced service assurance.

### Advanced AI Integration that Enables Autonomous Networks

The platform combines and integrates AI models for real-time order execution, post-order analysis, and closed-loop automation. This integration enables intelligent, self-adaptive, and efficient network operations, enhancing decision-making processes, optimizing workflows, and driving towards fully autonomous network capabilities

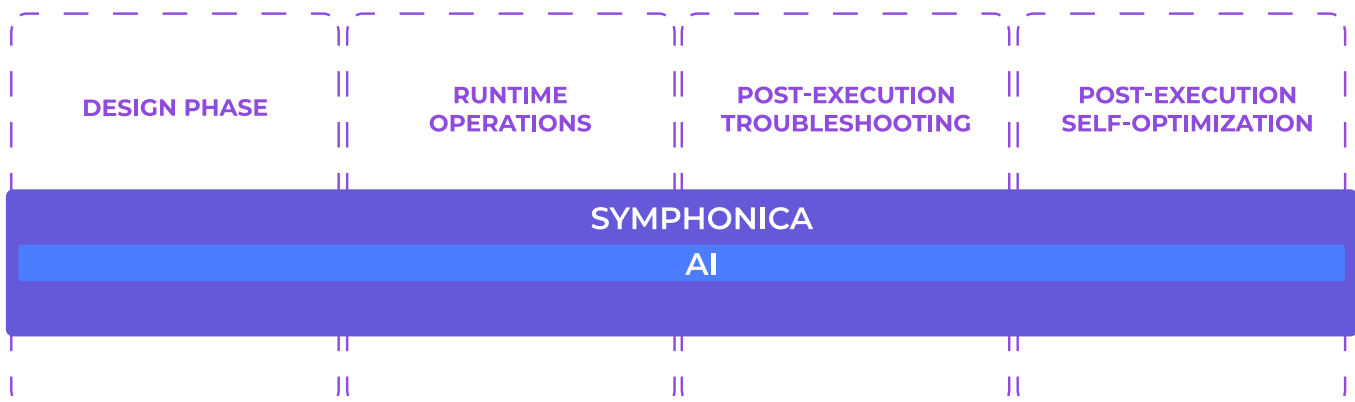
### Enhanced Security Features

Incorporates robust security measures to protect network operations and data integrity. This includes secure APIs, encrypted communications, and compliance with industry-standard security protocols. Its architecture is designed to safeguard against vulnerabilities, ensuring secure orchestration and service activation in multi-vendor and multi-technology environments.

## Symphonica's AI-Powered Capabilities: Reinventing Orchestration and Paving the Way Towards Level 5 Autonomous Networks

AI is at the heart of Symphonica, influencing every facet of the order orchestration process. This integration spans from the initial design phase to runtime operations and extends into post-execution troubleshooting. AI in Symphonica is not just an added feature; it is a fundamental enabler, pivotal for realizing automated closed-loop automation and achieving truly autonomous network operations.

### ORCHESTRATIONS PROCESS



## **Design Time Intelligence with Symphonica Copilot**

In the realm of design-time intelligence, Symphonica Copilot stands out as a transformative tool within Business Process Management. It provides a revolutionary approach by autonomously crafting initial templates and offering deep insights and optimization recommendations, thereby ensuring the most efficient and effective workflows.

This optimization is further complemented by its integration into the Connector Design Studio. Here, Symphonica Copilot leverages the platform's no-code capabilities to significantly streamline the process of creating complex connectors to network devices or third-party IT systems, whether through APIs or obscure CLI interfaces, by seamlessly guiding the user and automatically performing heavy-lifting tasks and otherwise time-consuming activities.

These automations, coupled with the no-code nature of the product, not only enable analysts without coding knowledge to build end-to-end processes faster, but also enable Autonomous Networks Level 4 and 5 AI models to understand and update the definition and functionality of these objects to perform intent-driven operations and suggest improvements or autonomously apply them.

## **Runtime AI-Model Training and Query During Order Execution**

Symphonica's integration of AI during order execution is designed to achieve two distinct but equally crucial outcomes, fundamentally enhancing the network operations process. First, this feature allows for the continuous training of any number of AI models in use, ensuring they stay up-to-date with comprehensive network information. This ongoing learning process is key for Autonomous Network and other external AI models to evolve and adapt in line with the network's changing dynamics, thereby ensuring their decisions and insights are richer and remain relevant and accurate.

Second, Symphonica's AI integration enables real-time querying of an external model during order processing. This capability is instrumental in making more informed and intelligent workflow decisions, significantly enriching the process. By querying the AI model, Symphonica can dynamically adjust the workflow based on AI-driven insights, drastically reducing order fallout and leading to more efficient and effective order processing.

Symphonica's implementation of this dual functionality is both innovative and remarkably user-friendly. Incorporating AI capabilities into workflows is as straightforward as dragging and dropping a box within the workflow designer. This intuitive approach to integration renders advanced AI technologies accessible and practical, even for those with limited AI or machine learning expertise.

Symphonica not only streamlines operational processes and embeds intelligence and adaptability into network operations but also effectively reduces the workforce skill gap in automation and AI, empowering teams to seamlessly transition towards a more autonomous and responsive network environment.

## **Closed-Loop Automation in Symphonica: AI-Driven Responsiveness**

Symphonica embraces closed-loop automation by harnessing readily available AI models to drive efficiency and responsiveness. This advanced application of technology is pivotal in transforming the way networks operate and adapt.

A key element of Symphonica's closed-loop system is its ability to enable AI-driven trend analysis and discovery. This powerful feature delves deep into network data to uncover patterns and insights that might otherwise remain hidden.

By analyzing trends over time, the AI model identifies typical operational journeys, anomalies, efficiency opportunities, and areas that could benefit from custom-triggered adjustments. It uses these insights to build and deploy new complementary workflows in Symphonica. The ability to anticipate and respond to evolving network conditions based on AI analysis ensures that workflows are not just reactive but also predictive and proactive.

Once these complementary workflows are deployed, the AI system is designed to automatically initiate specific workflows upon detecting the specific conditions within the network that configure the trend that will benefit from an adjustment.

This feature exemplifies the essence of closed-loop automation, where the system not only monitors and analyzes network data but also takes action based on those insights. The ability to autonomously launch workflows in response to real-time data makes the network self-regulating and adaptive, significantly reducing the need for manual intervention and streamlining operational processes.

### **Order Fallout Analysis, Troubleshooting and Optimization**

In the domain of post-order analysis, Symphonica leverages AI to transform the way traditional OSSs handle order fallout troubleshooting and optimization. This advanced application of Generative AI significantly enhances efficiency and effectiveness through two main functionalities.

#### **Simplified Log Analysis for Individual Orders**

Post-order processing in Symphonica is enriched by an AI-powered log analysis feature. This tool delves into the granular details of each order, providing straight-forward insights on the outcomes.

By quickly analyzing hundreds of logs generated by individual orders, it aids in precise troubleshooting, allowing network operators to quickly identify and rectify issues. This level of detailed analysis is instrumental in reducing downtime and improving customer satisfaction, as it enables faster resolution of order-related problems.

#### **Continuous Analysis of Multiple Orders Post-Execution**

Another critical aspect of Symphonica's post-order AI application is its ability to conduct continuous batch analysis on successful and failed orders to produce insights and optimization guidelines for humans, as well as straight directives for Autonomous Networks. This feature is particularly valuable in Level 3 ANs and below as sifting through the vast amounts of logs to identify patterns and anomalies can be extremely daunting, if not impossible, for humans. For Levels 4 and 5, the ongoing, extensive analysis is crucial for the perpetual self-optimization of the network.

For orders that were processed successfully, the AI system in Symphonica helps identify effective strategies and pinpoint potential enhancements. This continuous evaluation is vital for recognizing areas within workflows and connectors that can be optimized. By methodically learning from these successes, the system promotes the replication of efficient practices throughout the network, leading to enhanced overall performance and reliability.

In parallel, the AI's continuous scrutiny of failed orders helps detect operational flaws and pinpoint areas that need to be fixed. This regular examination helps to determine the root causes of failures,

whether they arise from workflow issues, connector configurations, or other operational aspects. The continuous stream of insights proves invaluable for targeted troubleshooting and focuses on refining specific areas for better network performance.

For Level 3 ANs, this comprehensive post-processing order analysis trains Symphonica's own Design Studio Copilot machine learning model to continuously improve the AI-driven insights it provides when assisting network operators in designing better workflows, connectors, and an overall operational strategy.

At Levels 4 and 5, the network independently initiates self-optimizing enhancements in both orchestration and provisioning workflows and connectors, autonomously triggering the necessary updates or leaving them ready for human approval.

The integration of AI in these post-order processes represents a significant stride towards more intelligent and responsive network management. It not only simplifies the troubleshooting and optimization tasks but also ensures that the network learns and evolves from each interaction. This ongoing learning process is key to building a more robust, efficient, and customer-centric autonomous network, which is critical in maintaining a competitive edge in an increasingly complex and demanding telecommunications landscape.

### **Symphonica's Change Management Governance within AIOps**

At Level 5, as outlined above, the AI model evolves autonomously and unpredictably in the orchestration and provisioning systems in the production environment. Even at Level 4, the system suggests changes that can be deployed at the push of a button.

TM Forum's AIOps Change Management Guide<sup>10</sup> discusses the technical and business risks posed by this radically new approach, and provides guidance to control and govern these self-driven changes. Symphonica adheres to most of the principles outlined in this guide, as well as other relevant guidelines generated by different working groups, both in the telecom industry and beyond.

***Symphonica proposes a dual-agent approach that provides for a clear separation between the “black box” and the actual system that controls the network.***

AI models are mostly “black boxes,” which makes it challenging to determine why they make a specific decision, prediction, or classification<sup>11</sup>. Within the AIOps Change Management domain, the TM Forum approach implies that the changes that affect a production network are executed directly by the AI model. While this might be the best case for some applications, within the realm of Orchestration and Provisioning, Symphonica proposes a dual-agent approach that provides for a clear

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<sup>10</sup>Guide. *IG1190B AIOps Change Management v1.0.1*. TM Forum, 2020. <https://www.tmforum.org/resources/how-to-guide/ig1190b-aiops-change-management-v1-0-0/>

<sup>11</sup> Guide. *IG1190 AIOps Service Management v5.4.0*. TM Forum, 2022. . <https://www.tmforum.org/resources/how-to-guide/ig1190-aiops-service-management-v5-4-0/>

separation between the “black box” and the actual system that controls the network. With this approach, the AI model requests a change and Symphonica deploys it (or not), allowing for maximum governance and configuration management<sup>12</sup> even while using or transitioning between different AI models.

Within Symphonica, when a self-driven change is requested by the AI model, the improvements are translated into new versions of processes or connectors, allowing the organization to create traceability for all changes and integrate the information and knowledge produced by the AI model into their existing Knowledge Management<sup>13</sup> processes. This approach ensures that teams and end-users are consistently up-to-date, while also meticulously tracking modifications for effective oversight, effortless rollback, swift revisions, and manual adjustments.

Prior to allowing the supervised or unsupervised deployment of machine- or traditional human-generated changes, Symphonica allows for the configuration of a series of automated checks against simulated network elements or digital twins and will not permit deployment unless these checks are successful.

Furthermore, Symphonica allows for the manual configuration of validation processes and progressive deployment policies depending on certain criteria, including the network elements or IT systems involved and the severity of the change.

Symphonica's design and architecture efficiently facilitate responsible AIOps Change Management. By marrying advanced AI capabilities with robust governance and traceability mechanisms, Symphonica ensures that changes to network operations enhance trust and efficiency without compromising control or safety. Its ability to adaptively integrate AI-driven suggestions while maintaining independent oversight represents a significant step in the journey towards smarter, more autonomous telecom environments.

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<sup>12</sup> Guide. *Reference IG1190A AIOps Configuration Management v3.0.0*. TM Forum, 2021. <https://www.tmforum.org/resources/how-to-guide/ig1190a-aiops-configuration-management-v3-0-0-2/>

<sup>13</sup> Guide. *IG1190E AIOps Knowledge Management v1.0.1*. TM Forum, 2020. <https://www.tmforum.org/resources/how-to-guide/ig1190e-aiops-knowledge-management-v1-0-0/>

## Summary and Key Takeaways

In the pursuit of fully autonomous networks, Communications Service Providers stand at the threshold of a transformative era, necessitating the adoption of scalable and innovative, no-code, AI-driven platforms. The quintessence of this transformation is underpinned by the unparalleled flexibility and scalability only afforded by truly cloud-native solutions. These platforms harness the unique dynamic nature of cloud storage and processing capabilities, offering an elasticity that is integral and absolutely necessary to train the models that automate network operations.

For CSPs, the path forward involves embracing no-code Operations Support Systems (OSS) that serve as gateways to these cutting-edge machine-learning platforms. These systems are not just tools for improving the management of network operations and reducing the workforce skills gap; they are enablers of digital transformation, driving CSPs towards maximum operational agility and efficiency.

Symphonica emerges as a paradigmatic example of the next-generation of OSS. Its end-to-end, no-code framework heralds a new era of expedited adoption and implementation. Symphonica's cloud-first design enables a seamless transition to the cloud, allowing CSPs to rapidly adapt to and leverage the benefits of AI and cloud technologies, radically accelerating the journey towards autonomous networks.

Rapid adoption and transformation are pivotal in a traditionally slow-moving industry where speed and agility have recently become paramount to staying competitive against new entrants and meeting ever-evolving customer demands.

As CSPs navigate the complexities of modern telecommunications, embracing cloud-first, AI-driven, no-code OSS solutions will be crucial in realizing the vision of autonomous, agile, and highly efficient network operations.

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<sup>1</sup> Report. *Autonomous networks: from concept to reality*. TM Forum, 2023.

<https://inform.tmforum.org/research-and-analysis/reports/autonomous-networks-from-concept-to-reality>

<sup>2</sup> Report. *Leveling Up: Achieving Level 3 Autonomous Networks and Beyond*. TM Forum, 2023.

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<sup>4</sup> White Paper. *Autonomous Networks: Empowering Digital Transformation For the Telecoms Industry*. TM Forum, 2019.

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<sup>6</sup> Report. *Leveling Up: Achieving Level 3 Autonomous Networks and Beyond*. TM Forum, 2023.

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<sup>7</sup> White Paper. *Intent-Driven Autonomous Networks: Paving the Way for the Future of Telecommunications*. IntraWay, 2023.

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<sup>8</sup> Blog. *Passionate About OSS*. Ryan Jeffery, 2023. (Accessed: 04 January 2024)

<https://passionateaboutoss.com/closing-the-oss-buyer-seller-chasm-solutions-part-4/>

<sup>9</sup> Web Page. *Open Digital Architecture (ODA)*. TM Forum, 2023. (Accessed: 04 January 2024)

<https://www.tmforum.org/oda/>

<sup>10</sup> Guide. *IG1190B AIOps Change Management v1.0.1*. TM Forum, 2020.

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<sup>11</sup> Guide. *IG1190 AIOps Service Management v5.4.0*. TM Forum, 2022.

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<sup>12</sup> Guide. *Reference IG1190A AIOps Configuration Management v3.0.0*. TM Forum, 2021.

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<sup>13</sup> Guide. *IG1190E AIOps Knowledge Management v1.0.1*. TM Forum, 2020.

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## About Symphonica

Symphonica is the award-winning next-generation service orchestration and provisioning platform of choice for forward-looking, AI-first, and cloud-first telecom operators. It is the first truly cloud-native, AI-driven, end-to-end, no-code OSS that is telco-grade proven. It uniquely automates the complete lifecycle of telecom services across diverse networks and technology domains. Designed for those seeking to enhance agility through automation, modernize operations, reduce costs, and transition towards a fully autonomous network, Symphonica delivers a comprehensive, standards-based solution for next-generation telecom needs.

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The Cloud-First, AI-First, No-Code OSS