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Swisscom Autonomy Blueprint

Successful transformation with Netcracker

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Executive Summary

"Autonomy was a key principle that we had to fulfil" Rudolf Strijkers, Swisscom

The telecom industry is at a turning point, where the ability to simplify operations, accelerate service delivery, and scale innovation determine competitive advantage. Swisscom, in partnership with Netcracker Technology, has demonstrated what this future looks like in practice. Their transformation initiative has not only earned them the **TM Forum Excellence Award for Impact & Innovation** but has also created a blueprint for how operators worldwide can move from complex legacy architectures to autonomous, agile, and customer-centric networks.

Swisscom is a long-time pioneer in progressive thinking and technology. Swisscom embarked on an **autonomous network journey** in 2016 with TV and then networks. However, Swisscom noted that it wasn't changing key metrics, such as time to market, quality, and most importantly, cost. Swisscom realised that traditional organisational structures and processes hindered innovation and efficiency. Swisscom therefore implemented a pioneering company-wide transformation - reorganising teams, breaking down monoliths, introducing new skills, and aligning business goals with technological advancements. The approach is now adopted across the company in 15 "Value Streams"

Swisscom concluded that the only way to achieve network autonomy (network automation and closed-loop control) was to first achieve **operational autonomy** at the domain level. This is an essential starting point that empowers each operational domain to act autonomously in delivering change.

At the core of Swisscom's approach was the decomposition of OSS into 30 **autonomous operational domains,** based on TM Forum's ODA framework.

With the domain boundaries defined, and teams in place, modernizing the IP Transport domain came first using **Netcracker Domain Automation Solution**. First, Swisscom proved that intent-driven orchestration, real-time inventory, and AI/ML automation can deliver immediate business impact: faster time to market, higher service stability, reduced costs, and measurable efficiency gains.

However, what makes this initiative truly transformative is not the success of a single domain but the **replicable blueprint** that was subsequently created. By offering the blueprint in the form of IT-as-a-Service, with standardized practices, and leveraging 80% shared components, Swisscom's domain teams can replicate this success across multiple areas, speeding up modernization and embedding autonomy at scale.

Swisscom's success was built on a solid business foundation, funding its new architecture through lifecycle events. By upskilling its workforce and fostering a new mindset, it established the groundwork for innovation and business success.

Swisscom can now innovate faster in each independent domain, allowing the introduction of new technologies and services without disrupting other domains, and accelerating key technology rollout like FTTH. It also means it is better able to support external integration and partnerships, with external capabilities more easily exposed to external partners, opening new collaboration and

business models. Swisscom has decreased the time from code-ready to mass rollout from 9-12 months to no longer than six weeks in the IP domain, meaning faster service launch that has reinforced Swisscom's reputation for innovation and customer experience. Swisscom is now well placed to respond quickly to inevitable telecom industry changes.

Transforming transformation

In this paper, Appledore dives into what has made the **Swisscom** transformation such a success and **Netcracker**'s role in supporting this. The transformation is discussed further in this [podcast](#).

The need for change

Swisscom's transformation efforts over the last decade have revealed deep-rooted issues. Early initiatives, including the adoption of agile methods in both TV and networks, failed to deliver faster time-to-market, better quality, or lower costs. Large transformation projects were slow, unpredictable, and hampered by the entrenched complexity in existing systems, tied to entrenched organisational ways of working. This complexity drove an ever-increasing backlog (what Swisscom terms technical debt), slowed innovation and delayed new service launches.

Organisationally, the operations and development teams were siloed, leading to inefficiencies and heavy reliance between teams. Agile methods alone did not eliminate these barriers. Swisscom acknowledged the need for a fundamental rethink of how people, processes, and IT collaborate, as legacy business processes and infrastructure had become too complex and resistant to change.

In 2021 Swisscom recognised that addressing its challenges required more than just reorganising teams or migrating to modern OSS. The shift demanded an entirely new way of working that needed to apply company wide – with new skills and a mindset change at multiple levels.

- At the **team level**, network and operations needed to think and work more like software teams, embracing a DevOps approach. This meant joining together and adopting practices such as open-source tooling, building CI/CD pipelines, and implementing test automation to accelerate delivery and improve quality. In fact each team would act like a small business within Swisscom. A decentralized governance framework was put in place to do peer reviews, share tools, challenges, and best practices.

- At the **architectural level**, Swisscom decided each domain must incorporate resources and services – everything needed for domain autonomy and automation. All domains would interwork only using TM Forum Open APIs in a NaaS model. Valuable time was spent between Swisscom and Netcracker upfront aligning on a common vision with replication and speed to market as the core focus from the start, enabling the adoption of an architectural framework that supported collaborative, large-scale development.

- At the **leadership level**, Swisscom realised it needed clear business-driven motivations for change. Transformation wasn't about achieving elegant architectures for their own sake; it had to deliver tangible business outcomes. This required learning how to secure funding,

build compelling business cases, and speak in a language that resonated with stakeholders to gain buy-in.

Doing things differently

Swisscom, working with Netcracker, addressed previous complexity and dependency problems by adopting **granular domain teams** with **enterprise-wide alignment**. This removed bottlenecks, ensured funding stability, and kept all network domains moving in sync, unlocking the agility that Swisscom's earlier transformation efforts had failed to achieve.

Breaking the network and operations into many **small, domain-focused teams** handling specific operational domains, for example, IP transport, optical transport, wireline access and data-center domain. This avoided the bottlenecks seen when large, centralised teams had to wait on other network areas to progress. Independent domains could move at their own pace without being held back by other areas due to dependencies.

Swisscom, with the help of Netcracker, invested significant time early on to define **a unified up-front vision across the business** with a single roadmap from the current to the future network for all of Swisscom. Instead of starting with isolated domain projects, all domains followed the same roadmap, avoiding rework and silos.

End-to-End Scale and Replication. Applied the same approach across the entire organisation, not just one domain, enabling consistency and reusability of solutions.

Business Case and Funding first. Positioned the transformation as one integrated programme, ensuring consistent investment and executive sponsorship. Funding and project justification are done over lifecycles. These provide the baseline investment to maintain capabilities. By anticipating lifecycles, Swisscom can redirect investment into the new architecture.

Autonomous domains - the foundation of Swisscom's success

The term domain automation is a widely used and possibly abused term in telecom, meaning many things to different people. For Swisscom, domain automation has two key aspects that enable long-term success:

- A self-contained operational unit with both the network/IT systems, utilizing a single DevOps toolchain, to deliver business value autonomously through a clearly defined set of services such as L2-VPNs or Access Lines, without needing constant support from other teams.

- Domain automation technology with modern cloud-native software, automating services and resources in a closed loop and exposing capabilities to other domains using open APIs.

Swisscom recognises that each operational domain has its distinct nature, requirements and scope, which influence how it is implemented. Some domains are purely network-focused (e.g., IP transport, optical, access or data center). Others are event-oriented, such as the fibre management domain. These differences needed to shape how processes, integrations, and orchestration were

designed. With growing experience, Swisscom is now able to anticipate domain-specific needs before starting new implementations.

Initially, Swisscom moved relevant IT systems into each domain so each domain team could own its full CI/CD pipeline. They adopted external references like **TM Forum's Network-as-a-Service blueprint** to guide their definitions. Over time, Swisscom have expanded beyond the network domains to around **30 Operational Domain Management (ODM) units** covering Wireline, Mobile, B2B, cloud, and other services.

Each domain was not just an architectural concept but was also **aligned to organisational structures**, with clear KPIs for autonomy. The goal was to achieve **end-to-end ownership of the domain**, the capability to achieve cross-domain orchestration, and a complete mapping of Swisscom's operations to the new architecture.

Skills change – the engine of Swisscom's success

The Swisscom domain model wasn't just a structural change; it also triggered **skills, mindset, and organisational transformation**.

- **Network-Centric to Software-Centric Thinking:** Network engineering–focused teams needed to adopt software development disciplines (version control, CI/CD pipelines, automated testing, and agile backlog management) within the operational network.

- **Owning the Full Delivery Chain.** By embedding the relevant IT systems into each domain, teams took responsibility for the entire DevOps toolchain, from code to deployment.

- **Architectural Skills and Complexity Management:** Swisscom's infrastructure was too complex to be fully understood with traditional documentation approaches. Using domain blueprints, architectural governance, and TM Forum standards, Swisscom aligned technical design with business outcomes.

- **End-to-End Autonomy and KPIs**: Autonomy wasn't just about resources; it required the right mix of skills inside each domain to avoid dependency on others. Swisscom tied KPIs to domain autonomy, requiring teams to develop cross-functional skills. in Network operations, Software development, Test automation, and Continuous monitoring and incident response

Business alignment – the driver of Swisscom's success

"You don't do these kinds of transformations just to reach a beautiful architecture. You need to do this to reach business goals and to find the right language to get the business buy-in" Matías Fernández, Head of Enterprise Architecture, Swisscom.

Real transformation required domain teams learning to **speak the language of the business**: creating business cases, aligning transformation to strategic goals, and securing investment across multiple domains, not just one. Swisscom's **funding approach** for its Operational Domain Management (ODM)

work was pragmatic and tightly linked to real business initiatives rather than purely technical aspirations.

1. **Start with a Success Story**. Swisscom began by tying the creation of a single ODM to one concrete network lifecycle and transformation cycles. This allowed them to demonstrate tangible benefits early, building credibility for further investment.

2. **No Funding for "Beautiful Architecture" Alone**. Financing came only when the work was embedded in tangible business outcomes.

3. **Lifecycle and Business-Event-Driven Funding** piggyback on network lifecycle events or product launches tied to visible, revenue- or efficiency-linked activities.

4. **Opportunistic Flexibility,** the ability to piggyback on unexpected events, such as sudden new product needs, with a flexible planning mentality and leveraging an architectural framework that was pre-defined and ready, meant the transformation could quickly leverage unexpected opportunities to advance ODM adoption when business events arose.

Modernizing and automating the first domain

"We've worked closely with Netcracker for years, and our bold transformation approach and proven success with the IP Transport domain is creating the path for autonomous networking company-wide," Andrea Sassara, Head of Operations Support Systems Development at Swisscom.

Netcracker was chosen as Swisscom's partner for the complete modernization, automation and implementation of the first domain - **IP Transport –** using [Netcracker's Domain Automation Solution](). This formed a domain **Implementation Playbook** distilled from Swisscom and Netcracker's IP Transport domain experience:

- **Software development readiness.** Swisscom already had a strong software development environment, unlike many telcos, which meant Netcracker could start quickly without first building DevOps capabilities from scratch.

- **Automation requires accurate data.** Unified and real-time inventory was the foundation for automation, providing a single source of truth. Swisscom's inventory systems were fragmented and inconsistent; unifying them and modernizing with cloud-native and real-time was the essential first step before automation could work effectively.

- Evolving to advanced automation features like **intent-based** orchestration, assurance AI/analytics, closed-loop automation **on the domain foundation**:

- **Maximize Domain Self-Sufficiency**. A domain needed to be autonomous for not just resources but also its services, avoiding cross-domain dependencies that slow down agility. This means managing all assets/resources within a domain's scope and delivering all services (from basic changes to service orchestration) without external dependency

- **Design for Multivendor Environments.** All automation and orchestration had to work across multiple vendors' equipment within the domain.

- **Staged Delivery of Autonomy**. Netcracker's approach was iterative, building toward a fully autonomous operational domain.

This playbook led to a **fully autonomous, multivendor IP Transport domain** in two years, with reusable foundations (tools, processes, frameworks) for subsequent domains. Most industry discussion is about network autonomy, focused on automation and closing the loop in network processes. However, Swisscom's definition of autonomy also focuses on operational autonomy of domains to deliver change autonomously of other domains (including automation and closing the loop to achieve its business goals).

Replicating success

Swisscom and Netcracker have since taken the **Domain Implementation Playbook** from IP Transport and have replicated it to another 6 domains. Central to this success have been several approaches:
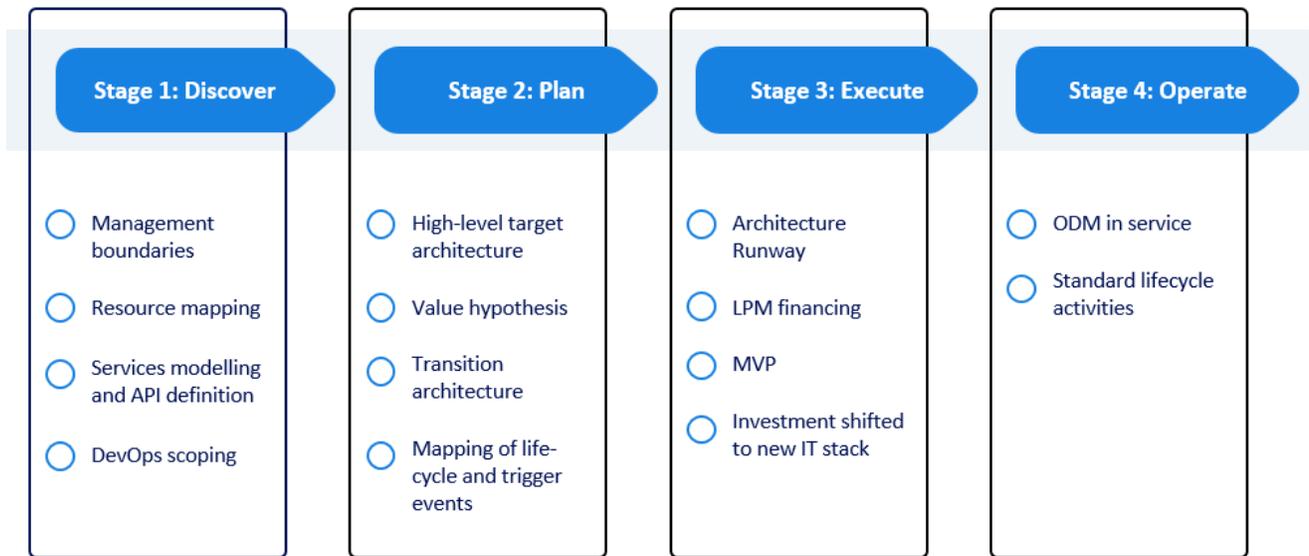
- Starting with **"high business value" domains** where lifecycle events, new product launches, or major refreshes are already planned.

- Using the IP Transport as a **"reference blueprint"** for technical architecture, DevOps processes, and KPI structures.

- Apply a **rolling wave delivery approach**, initiating domains in parallel only once foundational tools are stable.

- **Tie domain funding to business initiatives**, for example, if the access network needs lifecycle replacement, embed the domain autonomy transformation into that project.

- Maintain an **architectural readiness backlog** so that when a new lifecycle event happens, such as Swisscom's FTTH product launch, the domain is ready to adopt the autonomous model immediately.

- Use **success metrics from IP Transport** (OPEX savings, deployment speed, customer impact) to justify investment in new domains.

- **Seed Skills and Culture Shift**. Rotate experienced IP Transport team members into new domains as "seed" capability builders.

- Create a **centre of excellence** for orchestration, AI, and multivendor integration patterns.

- **Architecture & Tools Reuse** from IP Transport across all domains, including Unified inventory model & APIs, intent-based orchestration, and assurance & AI toolkit.

- Maintain **domain autonomy** but keep common integration standards so domains can coordinate when needed (especially for cross-domain services).

- Create **KPIs per domain,** including domain autonomy index, deployment cycle time, mean time to repair (MTTR), and OPEX efficiency.

- Use TMF **architectural maturity scoring** to track progress from partial to full autonomy.

- Keep transformation **governance** at the Domain Management level.

Swisscom and Netcracker estimate that this approach has:

- Cut transformation risk by 30–40% versus "big bang" transformation programs.

- More than halved the time taken to deliver a domain from approximately 24 months for IP Transport to 6 to 12 months by reusing frameworks.

- Increased business alignment by funding work only when business drivers exist and avoiding architecture-for-architecture's-sake.

- By focusing on getting foundation right in the first domain (IP Transport) all IT tooling, process change and people change capabilities were in place to transform other domains.

- Domain autonomy, with people and skills within each domain, avoided black box designs that could not be maintained by the domain team.

Figure 1: A common strategy to execution lifecycle process for all ODMs

Stage 1: Discover	Stage 2: Plan	Stage 3: Execute	Stage 4: Operate
Management boundaries	High-level target architecture	Architecture Runway	ODM in service
Resource mapping	Value hypothesis	LPM financing	Standard lifecycle activities
Services modelling and API definition	Transition architecture	MVP	
DevOps scoping	Mapping of life-cycle and trigger events	Investment shifted to new IT stack	

Source: Swisscom

New KPIs drive measurable success

Swisscom defined success with measurable autonomy, faster delivery, lower costs, better stability, and higher operational efficiency, with all metrics tied to concrete before-and-after comparisons.

- **Autonomy.** Success was tracked by examining team backlogs: fewer cross-team dependencies meant a more autonomous Operational Domain (ODM). The degree of organisational alignment directly correlated with higher autonomy scores.

- **Financial Performance**. Comparing the Status quo cost baseline with future-proof new architecture. Calculations showed the "future-proof" path delivered greater long-term savings and efficiency gains despite the upfront premium.

- **Technical Debt.** Swisscom calculated that they gained a 10% premium in delivered capability by removing technical debt (feature backlog) for each additional domain versus the older architecture.

- **Delivery Stability**. CI/CD pipelines, test automation, and complete lifecycle simulation in lab environments reduced manual interventions and sped up recovery and deployment. Swisscom has seen a 25% reduction in incidents after delivery changes and higher first-time-right releases

- **Agility & Time to Market**: New features delivered within a single two-week sprint. 80% of operational changes could be made during normal working hours instead of night shifts.

- **CAPEX Benefits**: Lower capital costs from faster development cycles and reuse of architecture.

- **OPEX Benefits:** Lower operating costs thanks to automation, reduced downtime, and improved manageability.

- **Faster Time-to-Market** with domain changes reduced from 6–9 months to just 2-4 weeks, and new domains can be delivered in 6-9 months, compared to 1.5–2 years previously.

- **Stability and Quality.** There has been 25% fewer incidents after changes, with automated CI/CD pipelines.

- **IT Cost Savings.** 30% savings achieved by removing interdependencies and simplifying the architecture.

- *Reduced Testing Costs.* 50% reduction with regression testing cycles reduced from months to 2–3 weeks.

Final takeaways

Swisscom's key advice to aspiring transformation programs is:

- **Know and agree on your architectural framework**. Having a clear, shared architecture gives critical orientation for planning, coordination, design, and decommissioning.

- **Tie funding to lifecycle events**. Transformation should be financed through concrete business or lifecycle events (e.g., product rollouts, system replacements), not as a standalone goal.

- **Ensure organisational alignment and leadership buy-in**. Success requires strong commitment from the CEO and top leadership, along with cross-organisational alignment.

Netcracker builds on this, noting that successful transformation requires:

- **Align early on the target vision**. Go beyond just the first project and agree on the midterm direction and next steps to avoid wasted time and cost.

- **Plan for replication from the start**. A clear, shared vision enables smoother scaling of solutions across multiple domains.

- **Foster close team collaboration**. Co-located, integrated teams working together daily help resolve issues early and maintain alignment.

Appledore believe this is an important step in delivering real change in how network operations systems and processes are delivered. Telecom has, for too long, had a history of extended transformation programs that fail to deliver, based on perfect "ivory tower" architectures divorced from business needs. Swisscom and Netcracker have shown a way out of this impasse, one that is both simple to understand and revolutionary in its impact.

Insight and analysis for telecom transformation.

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