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How to cut human error by 20–30% and boost manufacturing safety with AI video analytics

Real-time employee behavior monitoring, object detection and tracking to proactively prevent safety incidents before they occur

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Our team

Synaptik is a technology company specializing in AI-driven video analytics solutions for human and vehicle recognition

We solve key manufacturing challenges with AI video analytics by automatically detecting safety violations, unauthorized access, and operational anomalies without constant human monitoring

About us →

13+ years

working with manufacturing companies

>200 projects

in machinery, metalworking, food production, and more

45+

Software engineers in our team

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Our experts

Development engineers, machine learning engineers specialising in video analytics, business analysts, and hardware specialists
with industry expertise in:

Instrumentation industry

- Monitoring operator presence at workstations, tracking working time and downtime by shift
- Monitoring compliance with procedures and safety regulations with automatic detection and logging of violations

01

Machinery manufacturing

- Real-time monitoring of access to hazardous areas and verification of workers' compliance with mandatory PPE requirements
- Monitor employees' working and idle time, as well as workstation utilisation
- AI-powered detection of people and objects within a scene

02

Oil and gas industry

- Real-time monitoring and 24/7 support to protect your workforce in high-risk environments
- Logging all incidents and storing them in a central database
- Automatic shift-based reporting and analysis of movement patterns over time

03

Mining industry

- Monitoring vehicle loading with AI-powered video analytics
- Detects PPE violations and unauthorised entry into hazardous areas
- Detection and tracking of vehicles and personnel, with automatic logging of violations and report generation

04

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Target Customer Profile

- Medium and large enterprises focused on reducing safety incidents and gaining real-time visibility into personnel movement on-site
- Companies with annual revenue from 800M+ and staff of 100+ employees
- Industrial facilities operate enterprise management systems such as 1C:ERP and 1C:UPP, along with MES and CAD/PDM platforms, and are ready to integrate AI-powered video analytics into their existing IT infrastructure

Owner / CEO	Focused on maximising profitability and ROI while minimising operating costs and business risk through AI-driven insights
Production Director	Focused on optimizing production cycles and deadlines through total operational control and real-time response to any deviations
Shop Foreman	Focused on maintaining shift schedules and workstation efficiency, while ensuring real-time visibility and quick resolution of floor-level bottlenecks
Quality Director / Head of Quality Control (QC)	Focused on reducing defect rates and claims by digitally linking each incident to specific operating conditions for accurate root-cause analysis
Chief Engineer / Head of HSE	Focused on ensuring 24/7 PPE compliance and zone security, while automating incident logging and preventing unauthorized access to hazardous areas

Pain points

Unauthorised Access and Theft Risks

01.
Theft of materials and finished goods caused by lack of movement control

02.
Unauthorized access to the area by people or vehicles

03.
Misidentification of cargo, including incorrect items or shipments, leading to financial losses and operational delays

Human Error and Inconsistent Inspection

01.
Loss of working time due to late arrivals, early departures, and unscheduled breaks

02.
Operator absent from the workstation, equipment standing idle

03.
No objective data on actual staff utilization by shift

Process and SOP Violations

01.
Process deviations leading to defects (incorrect operation sequence, omitted process steps)

02.
No recording of root causes behind customer complaints

03.
No proactive monitoring of violations

Workplace Injuries

01.
Workplace injuries caused by missing PPE (helmets, vests) or presence in hazardous areas

02.
Not enough evidence during incident investigations, making it difficult to clearly determine fault

03.
Fines and enforcement orders from regulatory authorities for occupational health and safety violations

Key Capabilities

Monitoring intrusions into restricted areas

Access control and movement tracking: who enters/exits, where vehicles can go, and how materials move, with alerts on unauthorized actions

Staff behavior monitoring

Shows how many staff are on shift in each zone and triggers automatic alerts when workstations are idle

Production process control

Execution of key operations: sequence, cycle time, and critical steps, with every defect and complaint linked to the actual operating conditions

Safety compliance and PPE monitoring

Safety alerts: missing PPE, entering or working in restricted areas, and incident recording for later investigation

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Outcomes and impact

Video analytics can reveal how long operations take, where congestion occurs, or whether safety protocols are complied with during critical processes, and trigger real-time alerts so supervisors can respond immediately to deviation

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The Workflow

01

Cameras send the video stream to the video management system (VMS), which forwards it to the video analytics server

02

A neural network analyzes the video stream in real time, detects people and objects in the frame, compares their behavior with configured rules, and generates an alert whenever a deviation is detected

03

Alerts reach the responsible operator's workstation within 1–2 seconds, so they can initiate the prescribed response according to the safety procedures

04

The system logs all detected events and presents them in reports and dashboards for management

Behind The Tech:

01.

Computer Vision: Leveraging **state-of-the-art (SOTA) YOLO-class** convolutional neural networks for high-speed, real-time detection of personnel, machinery, materials, and PPE compliance

02.

Multi-Object Tracking (MOT): Advanced algorithms to monitor and analyze the movement of people and vehicles across predefined operational zones

03.

Event-Driven Architecture: A seamless pipeline that translates raw detections into actionable business events and system triggers

04.

Operational Analytics: Automated conversion of video events into high-level business metrics and real-time KPI dashboards

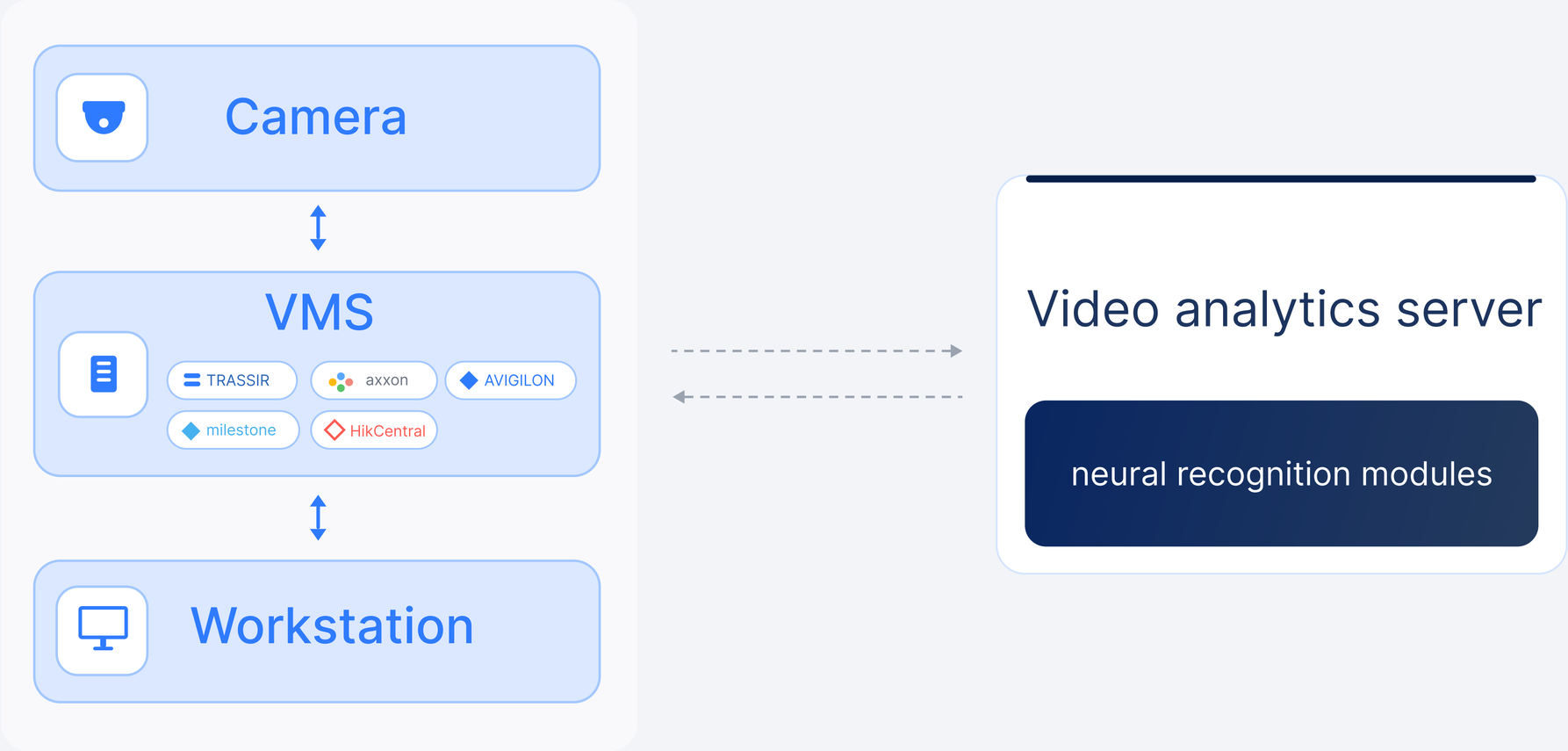
05.

Unified Evidence Store: A high-performance repository optimized for video metadata, including violation snapshots and comprehensive alert histories

06.

Integration Layer: A robust framework powered by REST APIs and message queues (MQ) for seamless connectivity with 1C, ERP, and MES ecosystems

How it works



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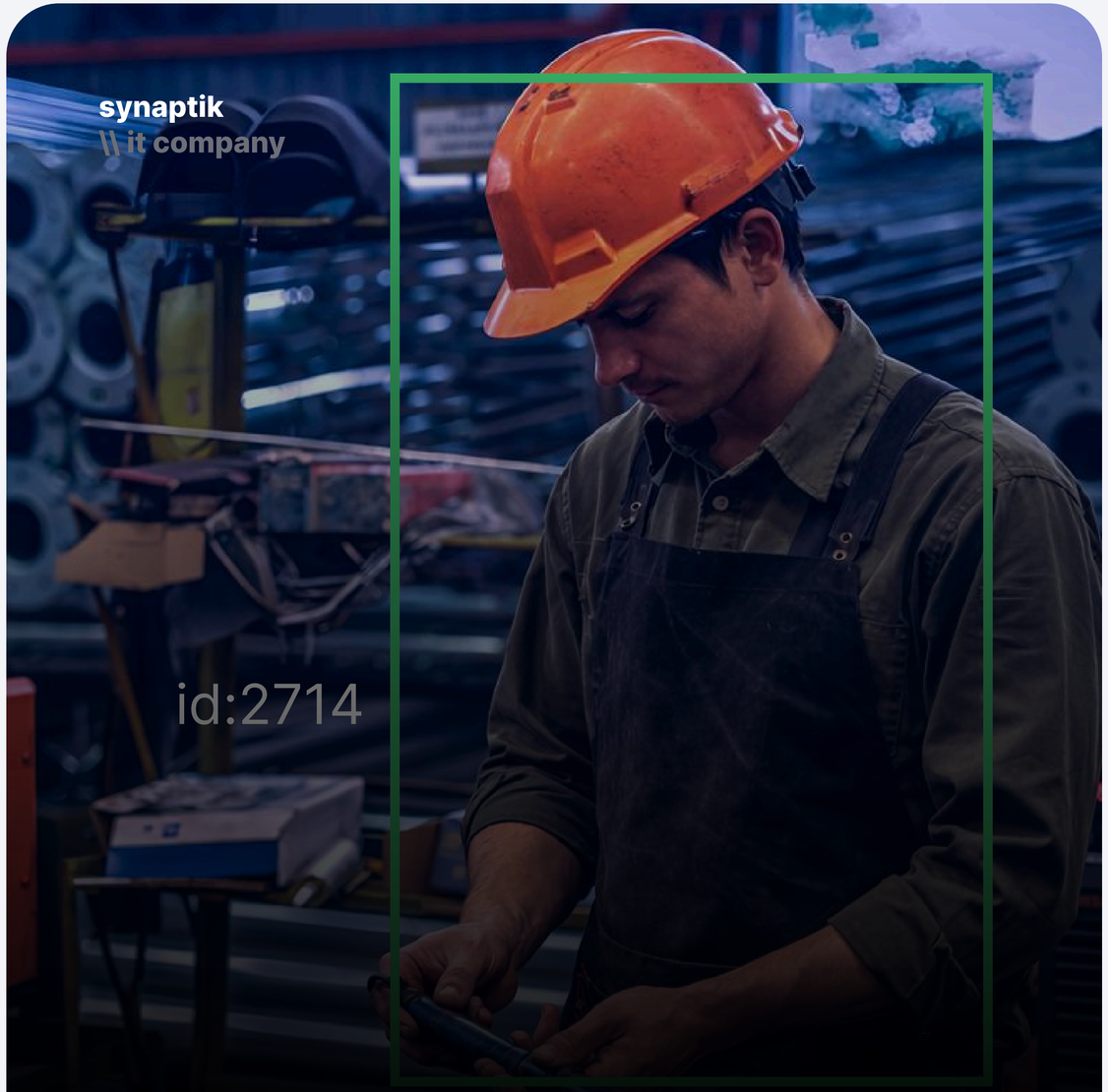

Top 5 Reasons to Choose Our AI Solution

Fast time to value: Results in 8 Weeks

We launch in a single pilot area without interrupting your production, fine-tuning algorithms to specific lighting and shift patterns. After reaching **95%+** accuracy and capturing the first measurable effects, we move to full-scale deployment

01

Minimal changes to existing infrastructure

The solution runs on top of your existing IP cameras and business systems, requires **no hardware replacement,** and does not disrupt shop floor operations

02

We stay with you until the line is running stably

We work as **one team** with your production, IT, and safety departments — from pilot to continuous monitoring — ensuring a measurable reduction in downtime and violations

03

It gets smarter together with your operations

Our video analytics models are **continuously retrained** the system becomes even more precise at recognizing your personnel, specific zones, and production processes

04

A long-term partner in solution development

We proactively adapt the system to new areas, processes, and shift patterns. By monitoring stability and updating models, we ensure ongoing improvements in operational efficiency and control

05

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Business Impact

Defect rate reduced by 70%

Human Factor in Quality Control: Manual inspection accuracy on high-speed lines inevitably drops from 85% to 60% by the end of a shift.

AI Solution: Our video analytics maintain 100% precision 24/7, significantly reducing defect rates and ensuring only perfect products reach your customers

Safety violations reduced 5×

Safety in High-Risk Operations: Conventional monitoring typically allows **for 5–10 safety** incidents per shift.

AI Impact: Deploying video analytics reduces incident frequency to **~1 per shift**, providing **proactive 24/7 protection**

Up to 10% increase in labor productivity

The Productivity Gap: Inefficient monitoring causes up to **20% of working** time to be lost to unplanned downtime

AI-Driven Optimization: Video analytics identifies bottlenecks, cutting downtime by **15–20%** and boosting overall productivity by up **to 10%**

Payback in under 12 months

The Cost of Inefficiency: Production losses from equipment downtime **(15–20%)**, scrap rates **(2–3%)**, and safety-related fines significantly drain budgets

Rapid ROI: Investments in AI video analytics typically pay for themselves within **4–12 months** through waste reduction and process optimization

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Case Study: Deploying video analytics at a food processing plant

Challenge

- Lack of precise real-time data on production output across 10 separate lines
- Inefficient cold storage usage: doors left open unnecessarily, leading to energy loss, product spoilage risks, and equipment wear
- Bottlenecks at handover points: delays in receiving and frequent discrepancies between production and warehouse figures
- Picking errors and long resolution times: frequent short picks and wrong items took hours to reconcile manually

Solutions

- Deployed video analytics with modules for line productivity, personnel monitoring, and warehouse control
- Configured automated production output tracking for each line with 99.7% accuracy
- Automated monitoring of cold storage doors, synchronized with active production cycles
- Enabled real-time staff tracking in receiving areas and shipment control
- Integrated the system with WMS for automated order picking verification

Outcome

- 99.7% automated counting accuracy, cutting manual spot checks to 1–2% of batches
- 3x reduction in idle cold storage door opening time, reducing spoilage risks and equipment wear
- Handover bottlenecks eliminated: production-to-warehouse discrepancies reduced to isolated monthly cases
- Order picking resolution time cut from hours to 5–10 minutes driven by WMS and event-based tracking

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Case Study: Industrial Safety Transformation in Oil & Gas

Challenge

- High occupational injury rates and fatality risks
- Lack of automated PPE compliance monitoring (helmets, high-vis vests)
- Inability to track personnel in hazardous zones or prevent incidents in real time
- Insufficient evidence base for incident investigation and safety violation analysis

Solution

- Developed a neural network-based video analytics system
- Trained models for real-time person detection and PPE compliance (helmets, high-visibility vests)
- Configured automated hazard zone monitoring and instant violation logging
- Implemented instant alerts to safety officers' workstations upon incident detection
- Provided automated reporting with photo evidence for post-incident analysis

Outcome

- 24/7 automated PPE and hazard zone monitoring, reducing unmonitored shifts to zero
- 100% of safety violations captured with photo evidence and logged for incident analysis and disciplinary action
- Real-time alerts sent within 1–2 seconds, enabling immediate response before an incident escalates
- 3x–5x reduction in safety incidents due to instant response and proactive violation management

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Let’s discuss your Operational Goals

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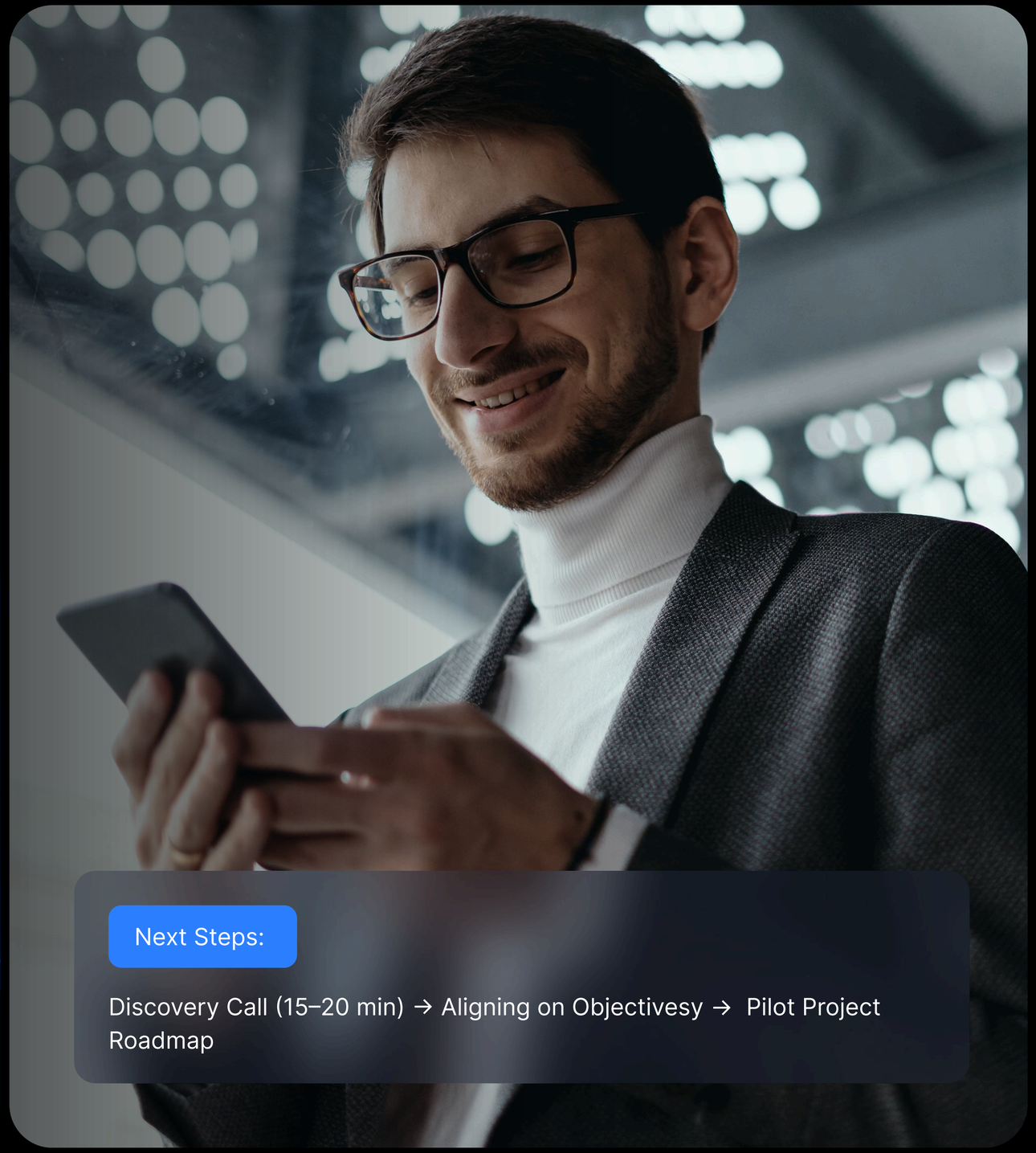

Next Steps:

Discovery Call (15–20 min) → Aligning on Objectivesy → Pilot Project Roadmap