IT SOLUTIONS FOR HEALTHCARE

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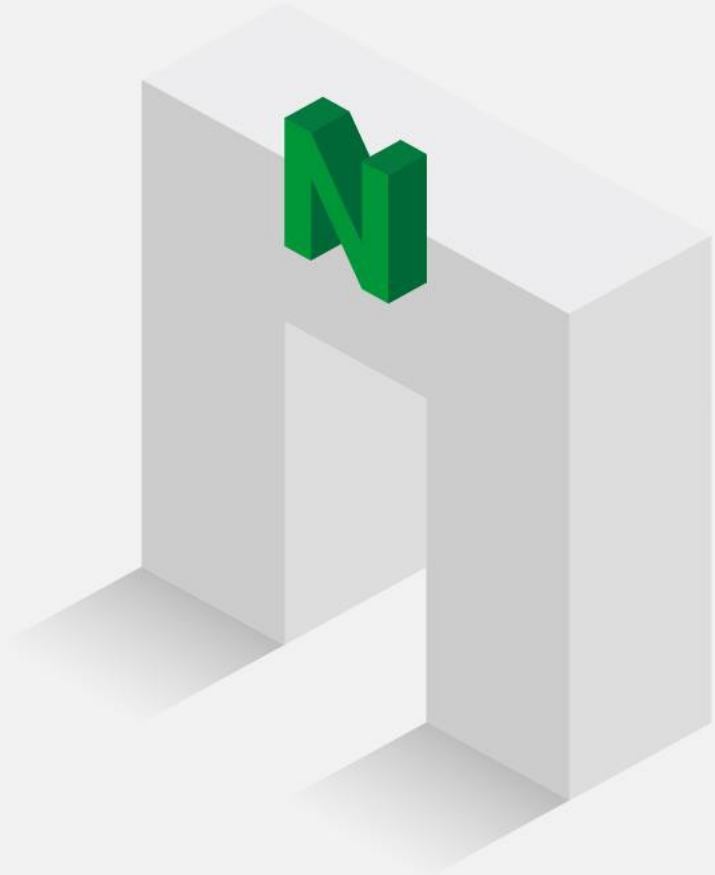
ABOUT NORTAL



IT SERVICES FROMYEAR 1985

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1985
CCC Oy established in Oulu, Finland

2000
Webmedia established in Estonia

2005
International business starts

2006
Serbia operations start

2009
Qatar deliveries start

2010
Oman deliveries start

2011
CCC merges with Webmedia

2012
Company rebranding as Nortal

2016
Acquisition of Swedish Element AB

2018
New office in Düsseldorf, Germany; Acquisition of Dev9, USA

2019
New offices in UAE and USA

GLOBAL EXPERIENCE WITH LOCAL DELIVERY CAPACITY

We create and implement user-friendly services out of complex processes

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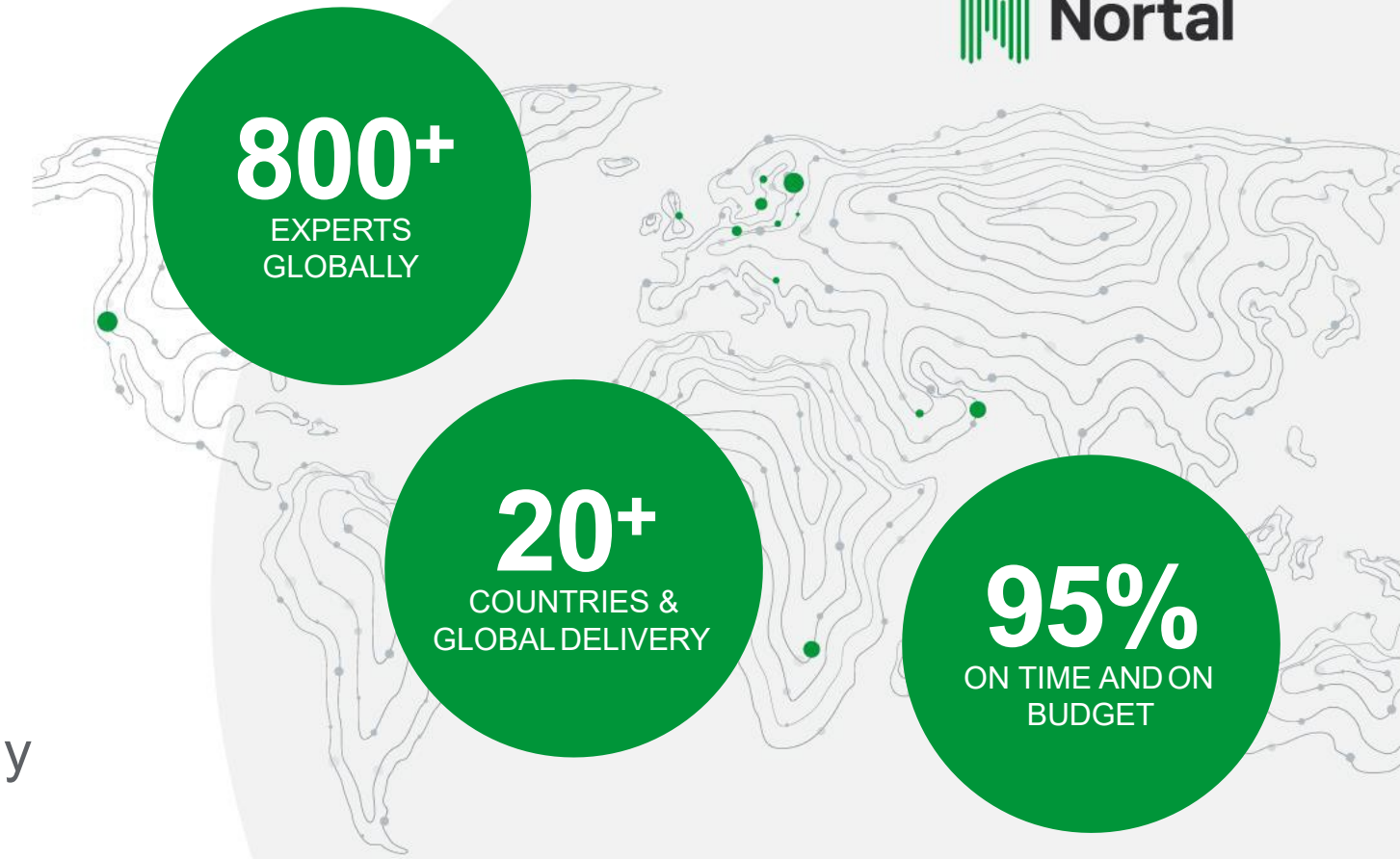

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CURRENT CHALLENGES IN HEALTHCARE

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CURRENT SITUATION

OUTDATED TECHNOLOGY

CLOSED APIS

POOR USER EXPERIENCE

VENDOR LOCK

KNOWN ISSUES

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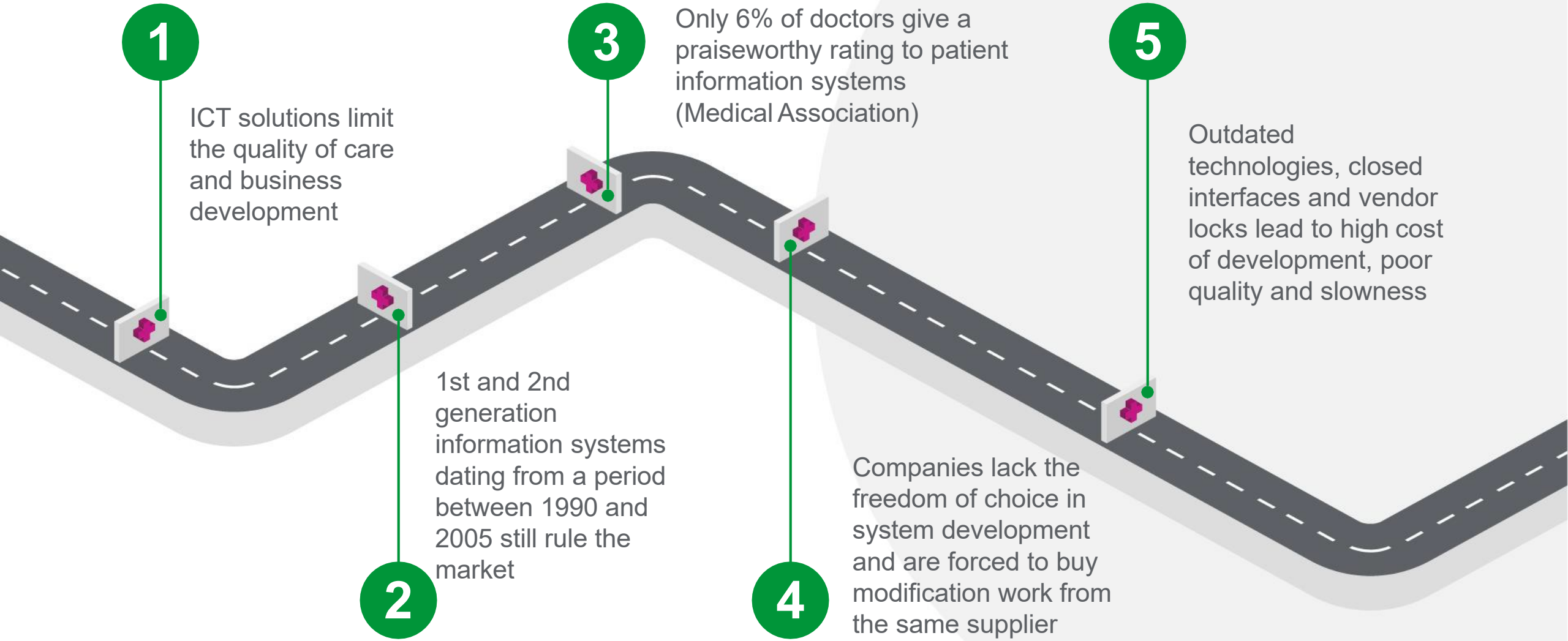

1. ICT solutions limit the quality of care and business development
2. 1st and 2nd generation information systems dating from a period between 1990 and 2005 still rule the market
3. Only 6% of doctors give a praiseworthy rating to patient information systems (Medical Association)
4. Companies lack the freedom of choice in system development and are forced to buy modification work from the same supplier
5. Outdated technologies, closed interfaces and vendor locks lead to high cost of development, poor quality and slowness

NORTAL'S VISION

- **Reforming healthcare** information systems in Finland is **essential.**

- Healthcare professionals deserve state-of-the-art **modern information systems.**

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ECOSYSTEM THINKING

NORTAL - HEALTHCARE ECOSYSTEM

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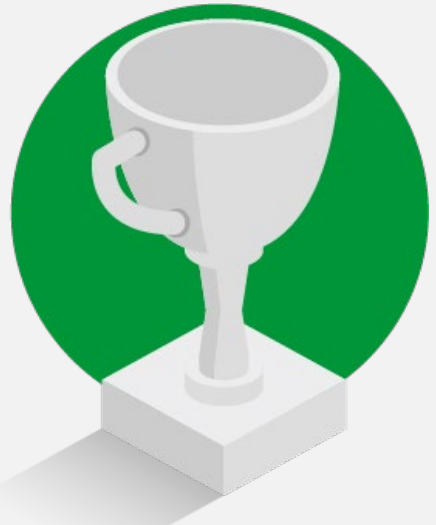
Leading business solutions combined with a certified clinical system

NORTAL HIS
MICROSOFT DYNAMICS 365
AZURE, AWS, GCP

Open and modular architecture combined with high quality APIs

HYBRID CLOUD
100% API COVERAGE
DEVOPS AND AUTOMATION

User-centric design and world class user experience



DASHBOARDS
MOBILE SUPPORT
WORKFLOWS AND GUIDANCE

ECOSYSTEM BUILDING BLOCKS

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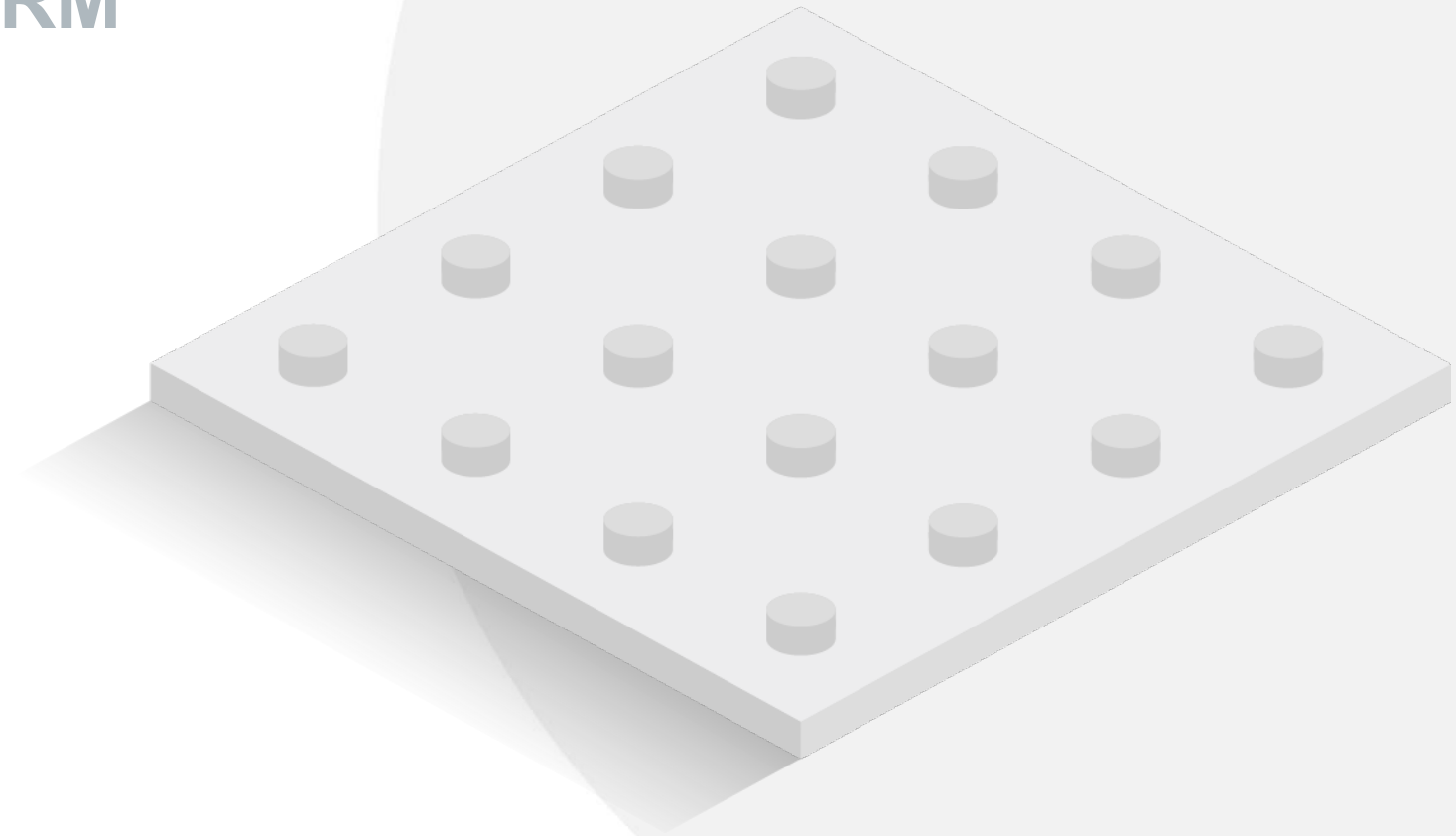
1 CLOUD PLATFORM



ECOSYSTEM BUILDING BLOCKS

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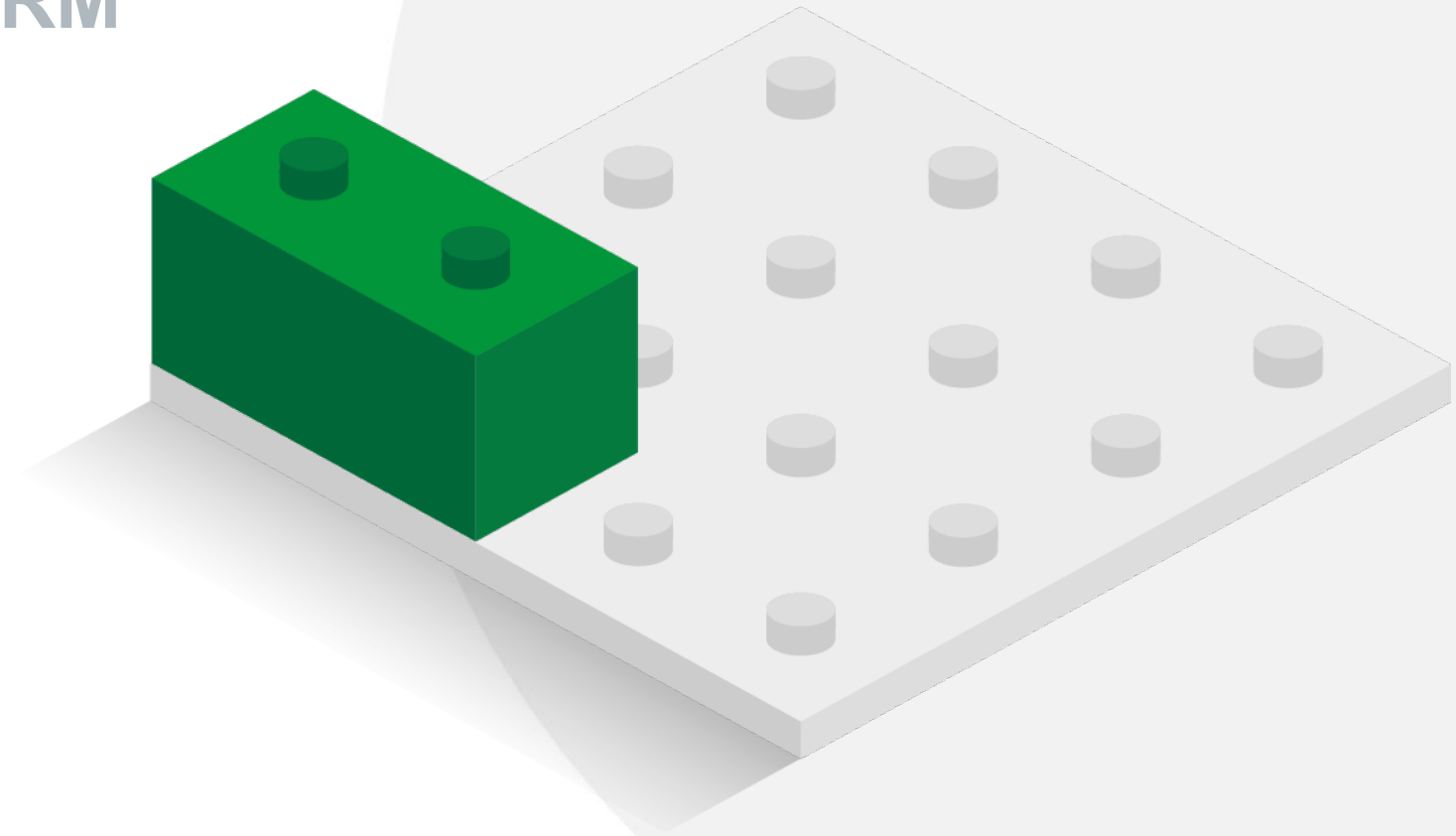
1 CLOUD PLATFORM

2 NORTAL HIS



ECOSYSTEM BUILDING BLOCKS

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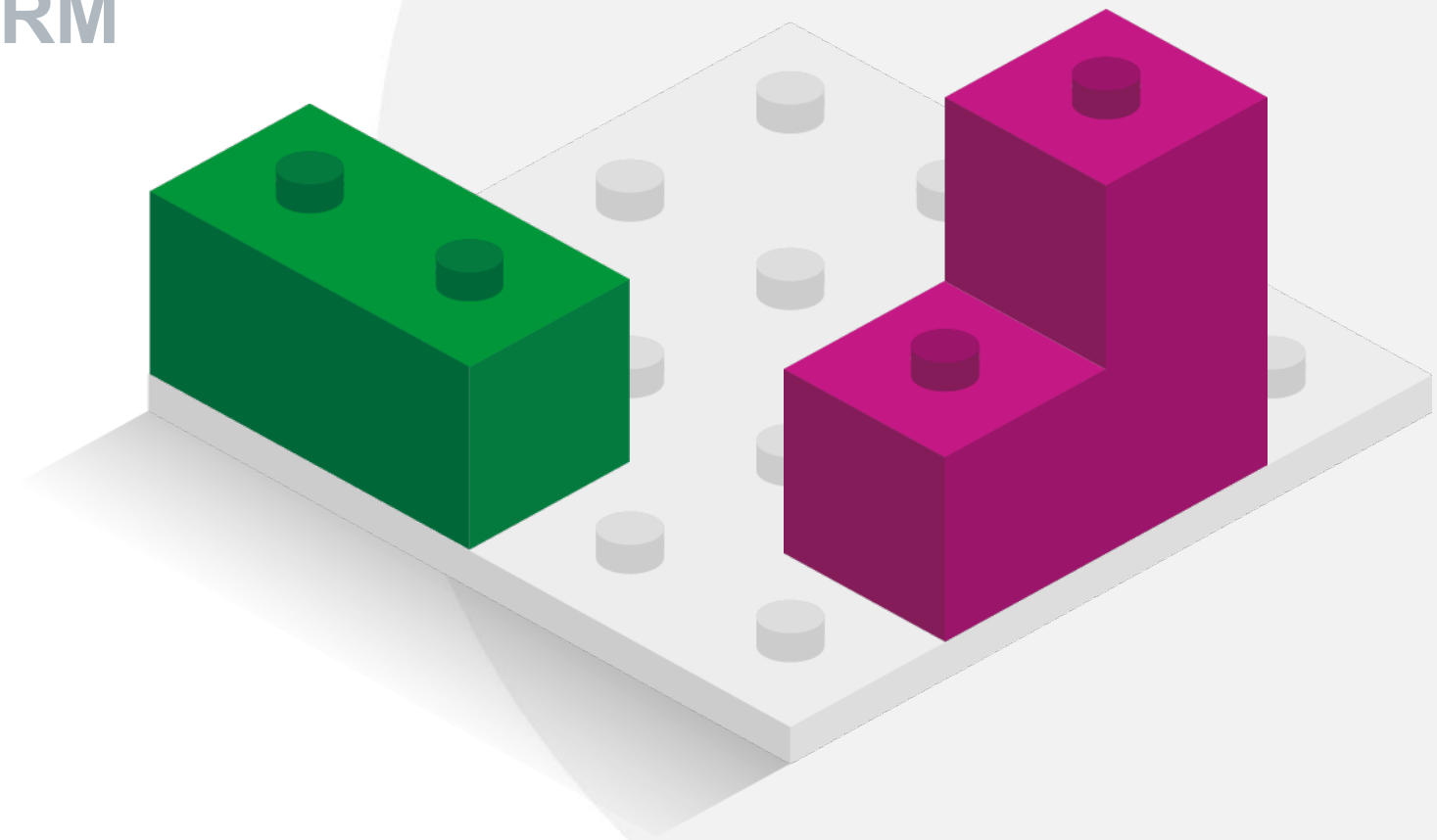
1. CLOUD PLATFORM
2. NORTAL HIS
3. ERP



ECOSYSTEM BUILDING BLOCKS

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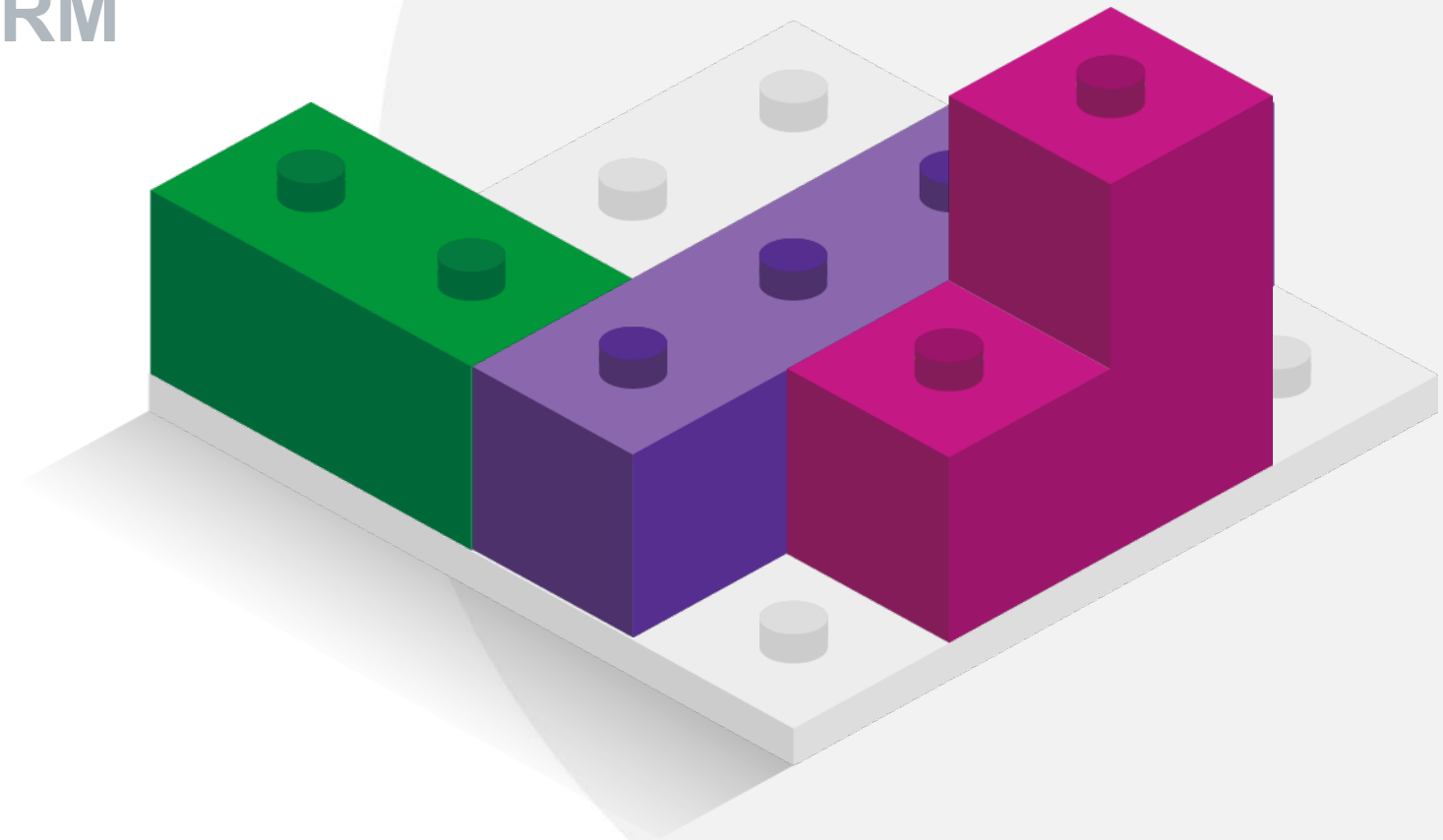
1. CLOUD PLATFORM
2. NORTAL HIS
3. ERP
4. CRM



ECOSYSTEM BUILDING BLOCKS

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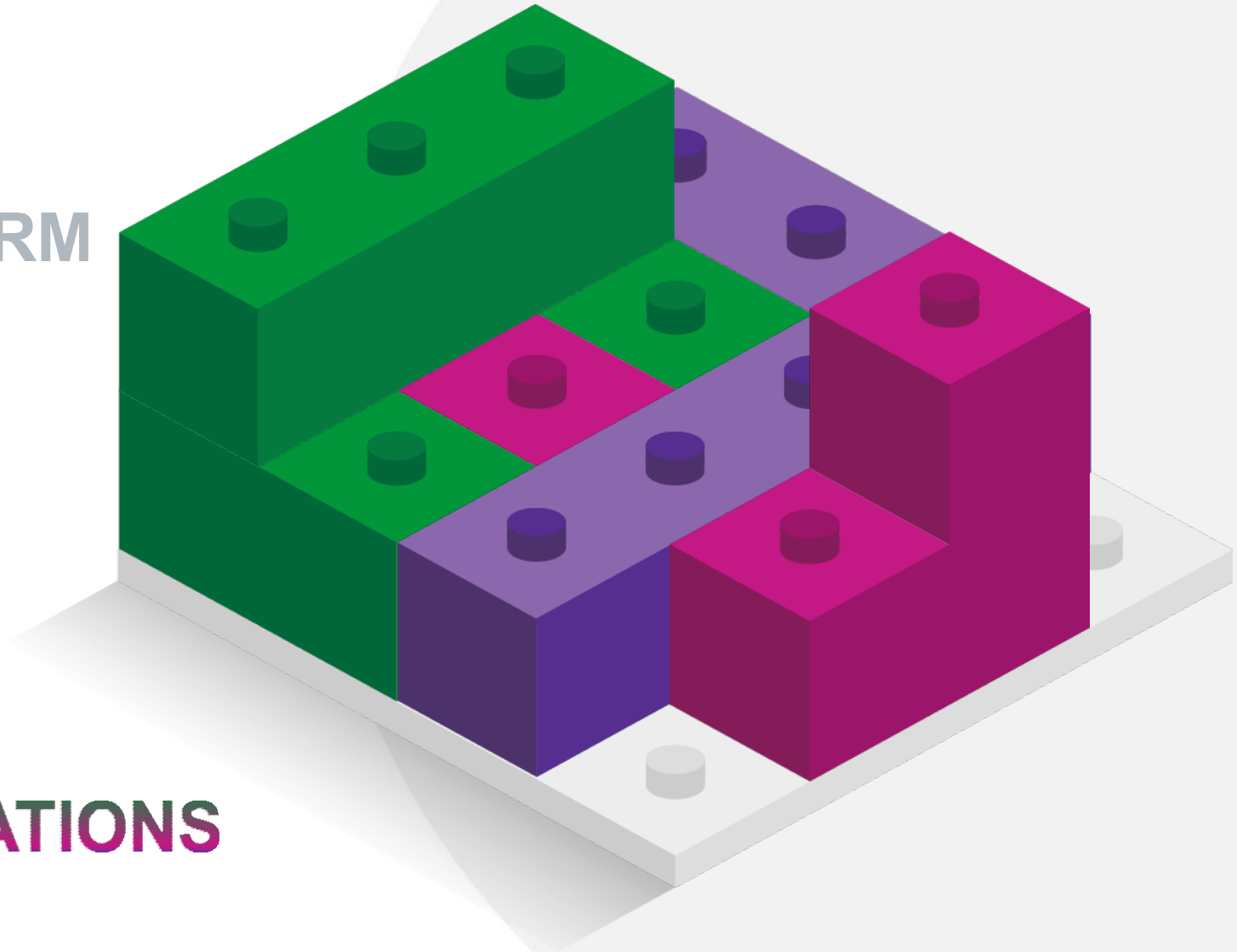
1. CLOUD PLATFORM
2. NORTAL HIS
3. ERP
4. CRM
5. OTHER APPLICATIONS



DEVELOPMENT PRINCIPLES

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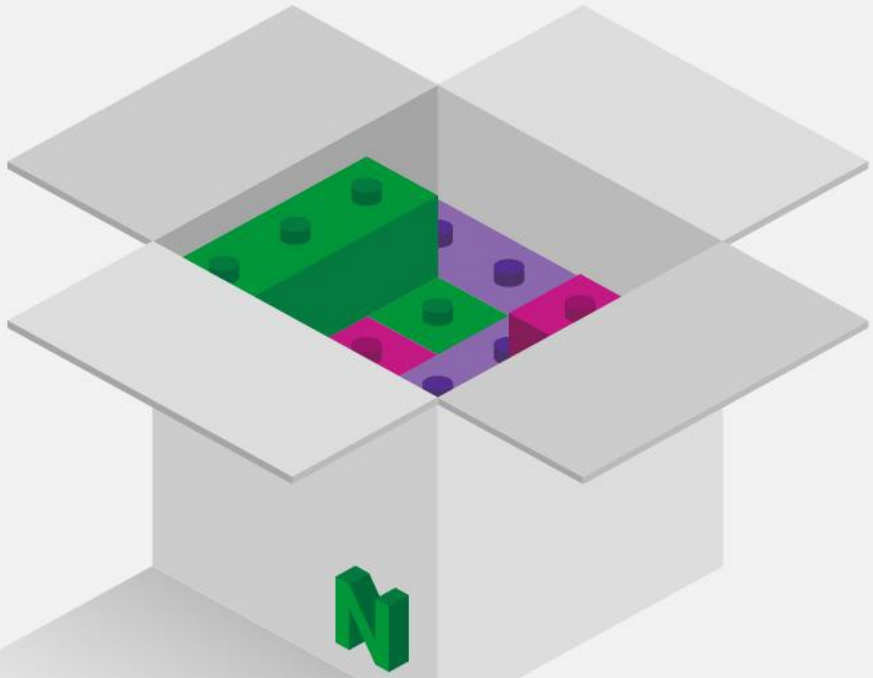
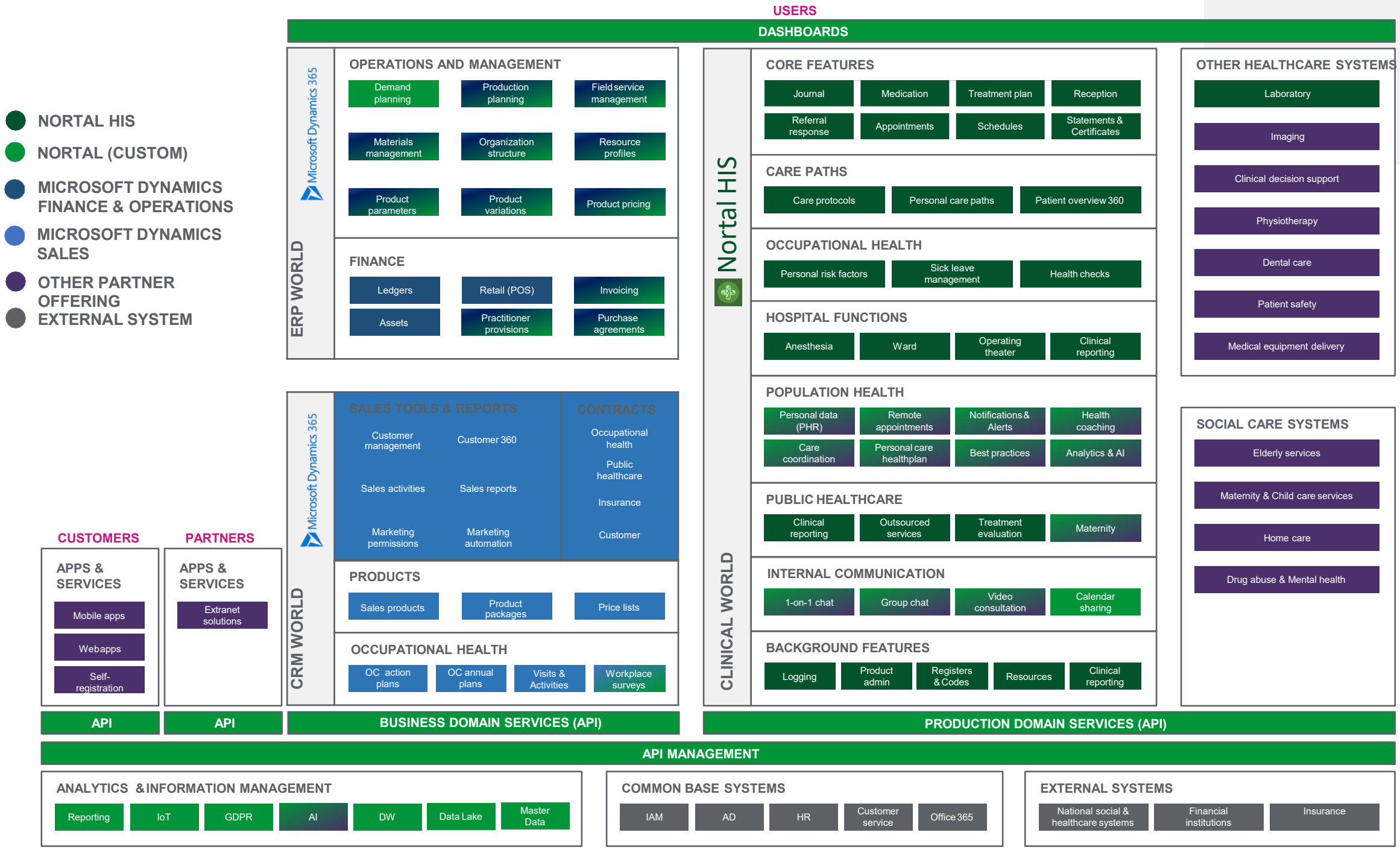
- Open APIs
- Customer-centric design
- Proper focus on lifecycle management
- Controlled tailoring of the system
  - Customer-specific business rules
  - Automation of manual processes
  - User interface tailoring
  - Integrations




NORTAL HIS
NORTAL (CUSTOM)
MICROSOFT DYNAMICS FINANCE & OPERATIONS
MICROSOFT DYNAMICS SALES
OTHER PARTNER OFFERING
EXTERNAL SYSTEM
USERS
DASHBOARDS
ERP WORLD
Microsoft Dynamics 365
OPERATIONS AND MANAGEMENT
Demand planning
Production planning
Field service management
Materials management
Organization structure
Resource profiles
Product parameters
Product variations
Product pricing
FINANCE
Ledgers
Retail (POS)
Invoicing
Assets
Practitioner provisions
Purchase agreements
CRM WORLD
Microsoft Dynamics 365
SALES TOOLS & REPORTS
Customer management
Customer 360
Sales activities
Sales reports
Marketing permissions
Marketing automation
CONTRACTS
Occupational health
Public healthcare
Insurance
Customer
PRODUCTS
Sales products
Product packages
Price lists
OCCUPATIONAL HEALTH
OC action plans
OC annual plans
Visits & Activities
Workplace surveys
CLINICAL WORLD
Nortal HIS
CORE FEATURES
Journal
Medication
Treatment plan
Reception
Referral response
Appointments
Schedules
Statements & Certificates
CARE PATHS
Care protocols
Personal care paths
Patient overview 360
OCCUPATIONAL HEALTH
Personal risk factors
Sick leave management
Health checks
HOSPITAL FUNCTIONS
Anesthesia
Ward
Operating theater
Clinical reporting
POPULATION HEALTH
Personal data (PHR)
Remote appointments
Notifications & Alerts
Health coaching
Care coordination
Personal care healthplan
Best practices
Analytics & AI
PUBLIC HEALTHCARE
Clinical reporting
Outsourced services
Treatment evaluation
Maternity
INTERNAL COMMUNICATION
1-on-1 chat
Group chat
Video consultation
Calendar sharing
BACKGROUND FEATURES
Logging
Product admin
Registers & Codes
Resources
Clinical reporting
OTHER HEALTHCARE SYSTEMS
Laboratory
Imaging
Clinical decision support
Physiotherapy
Dental care
Patient safety
Medical equipment delivery
SOCIAL CARE SYSTEMS
Elderly services
Maternity & Child care services
Home care
Drug abuse & Mental health
CUSTOMERS
APPS & SERVICES
Mobile apps
Web apps
Self-registration
PARTNERS
APPS & SERVICES
Extranet solutions
API
API
BUSINESS DOMAIN SERVICES (API)
PRODUCTION DOMAIN SERVICES (API)
API MANAGEMENT
ANALYTICS & INFORMATION MANAGEMENT
Reporting
IoT
GDPR
AI
DW
Data Lake
Master Data
COMMON BASE SYSTEMS
IAM
AD
HR
Customer service
Office 365
EXTERNAL SYSTEMS
National social & healthcare systems
Financial institutions
Insurance

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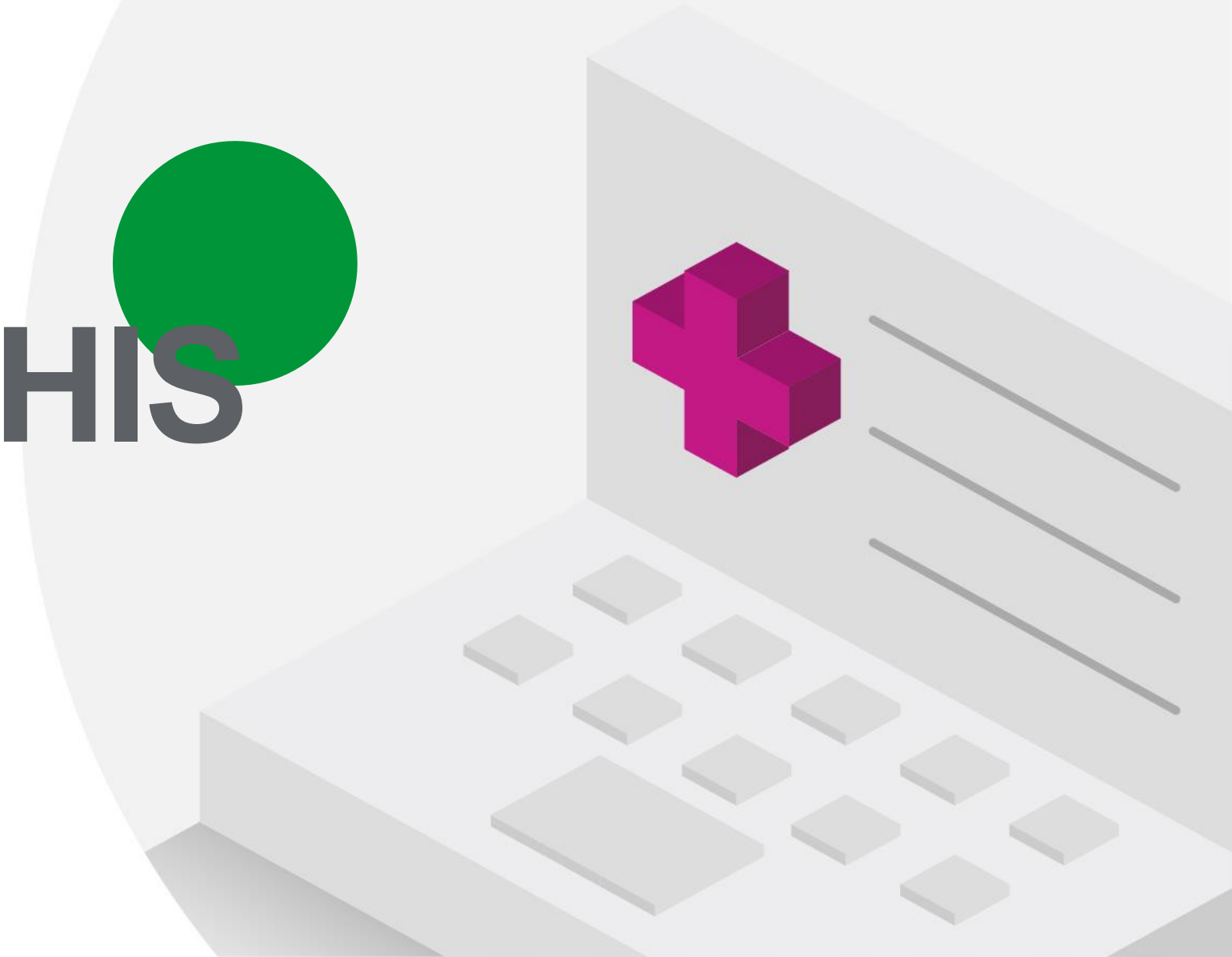
NORTAL HIS



OVERVIEW

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FUNCTIONS

- Regulatory compliance
- Appointments
- Reception
- Laboratory
- Diagnostics
- Hospital operations
- Occupational health
- Medication
- Referral-Response

DESIGN PRINCIPLES

- User centric
- Co-creation: we create and design together with and for the healthcare professionals
- Professional and experienced development team
- Continuous Improvement

PERSONAL DESKTOP

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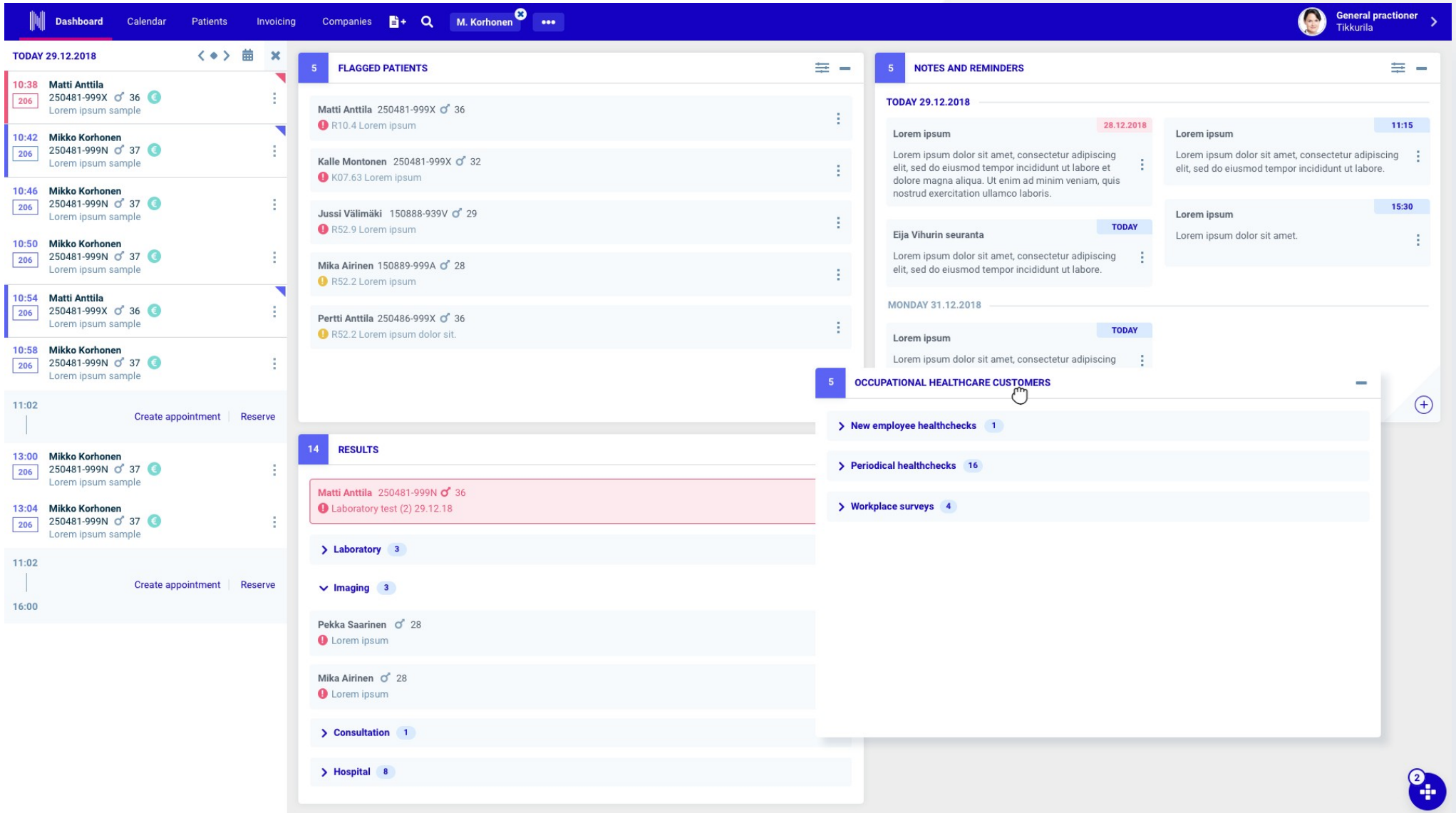

PERSONAL DESKTOP

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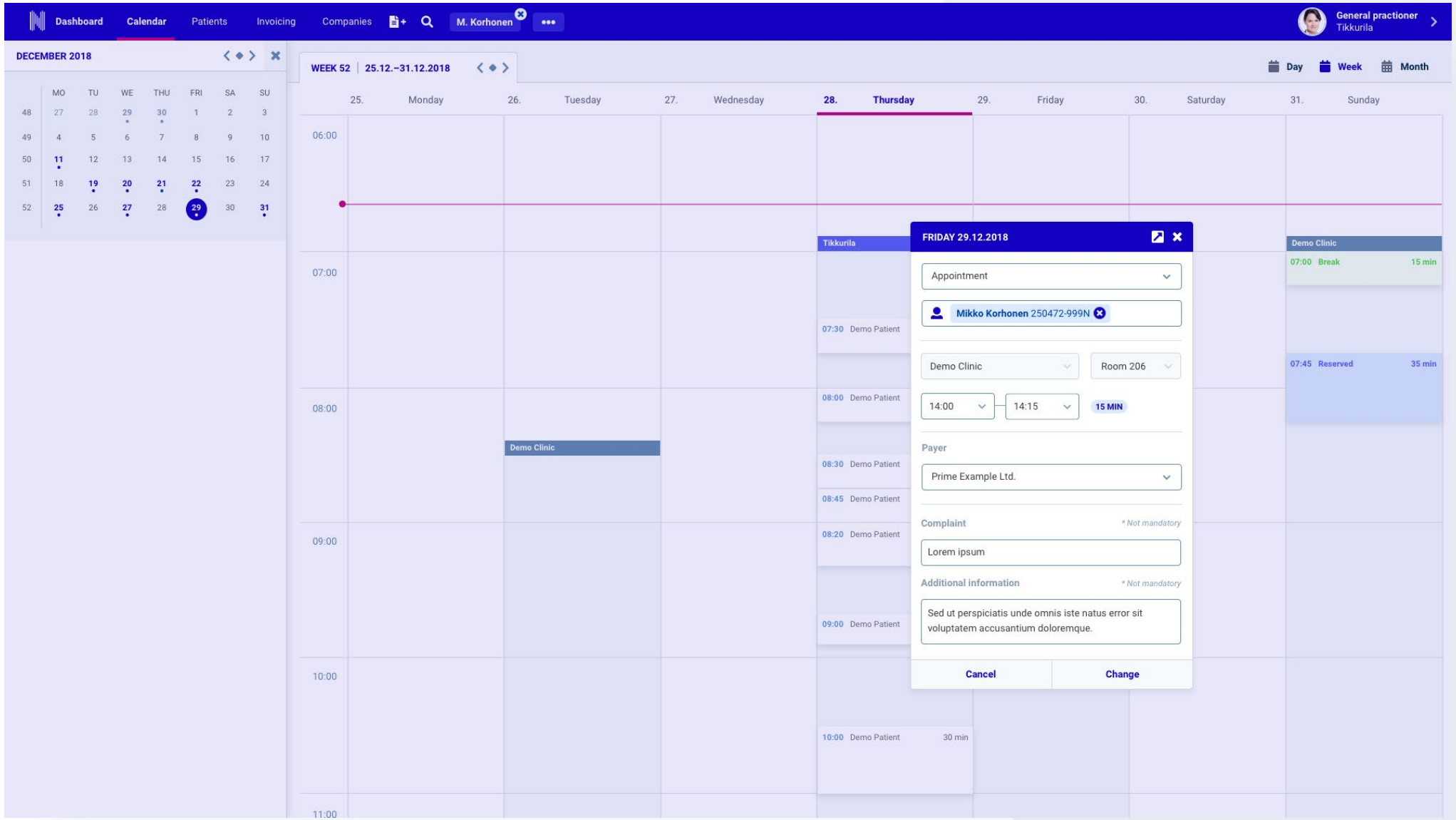

PATIENT VISIT

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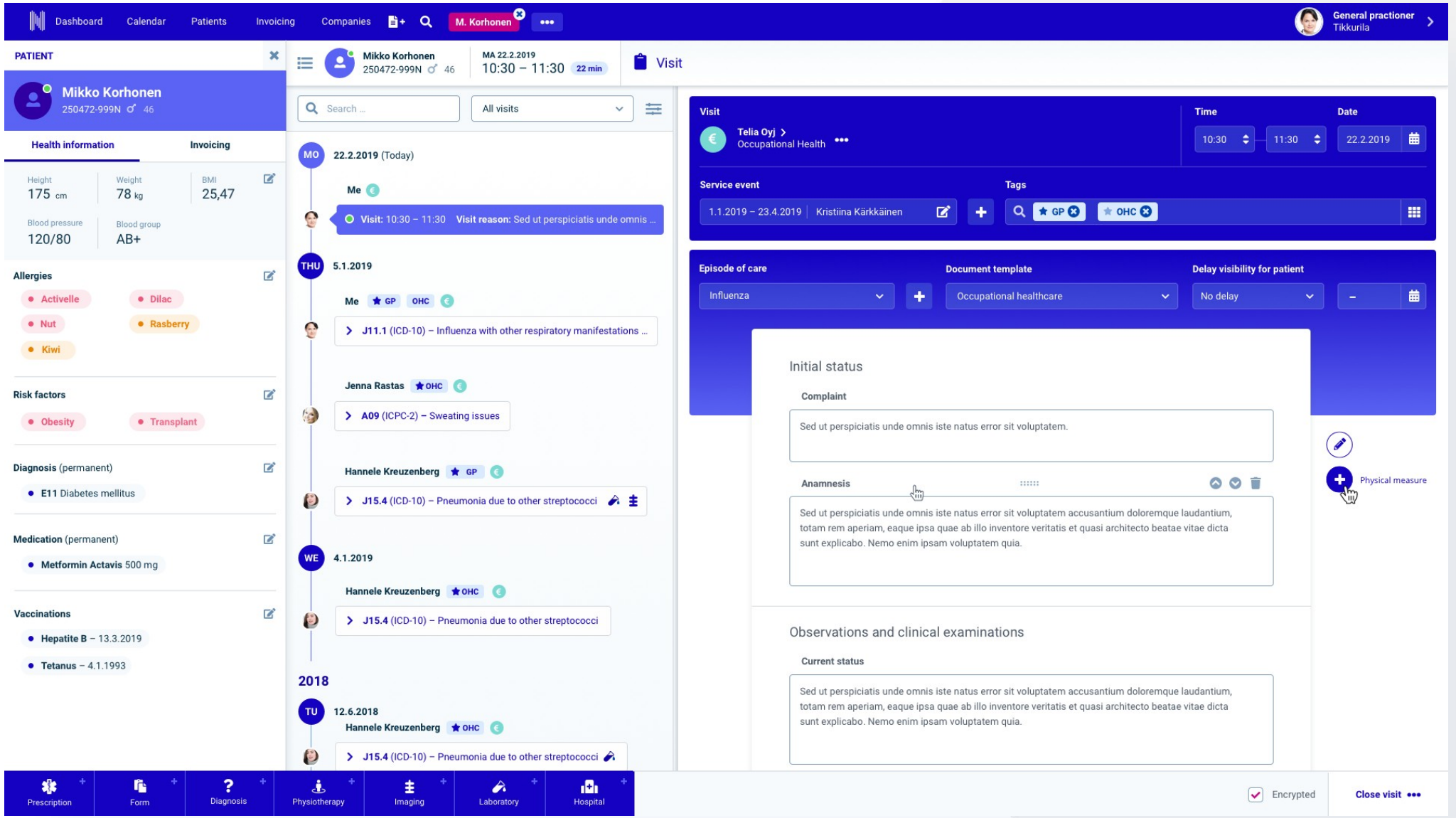

PATIENT VISIT

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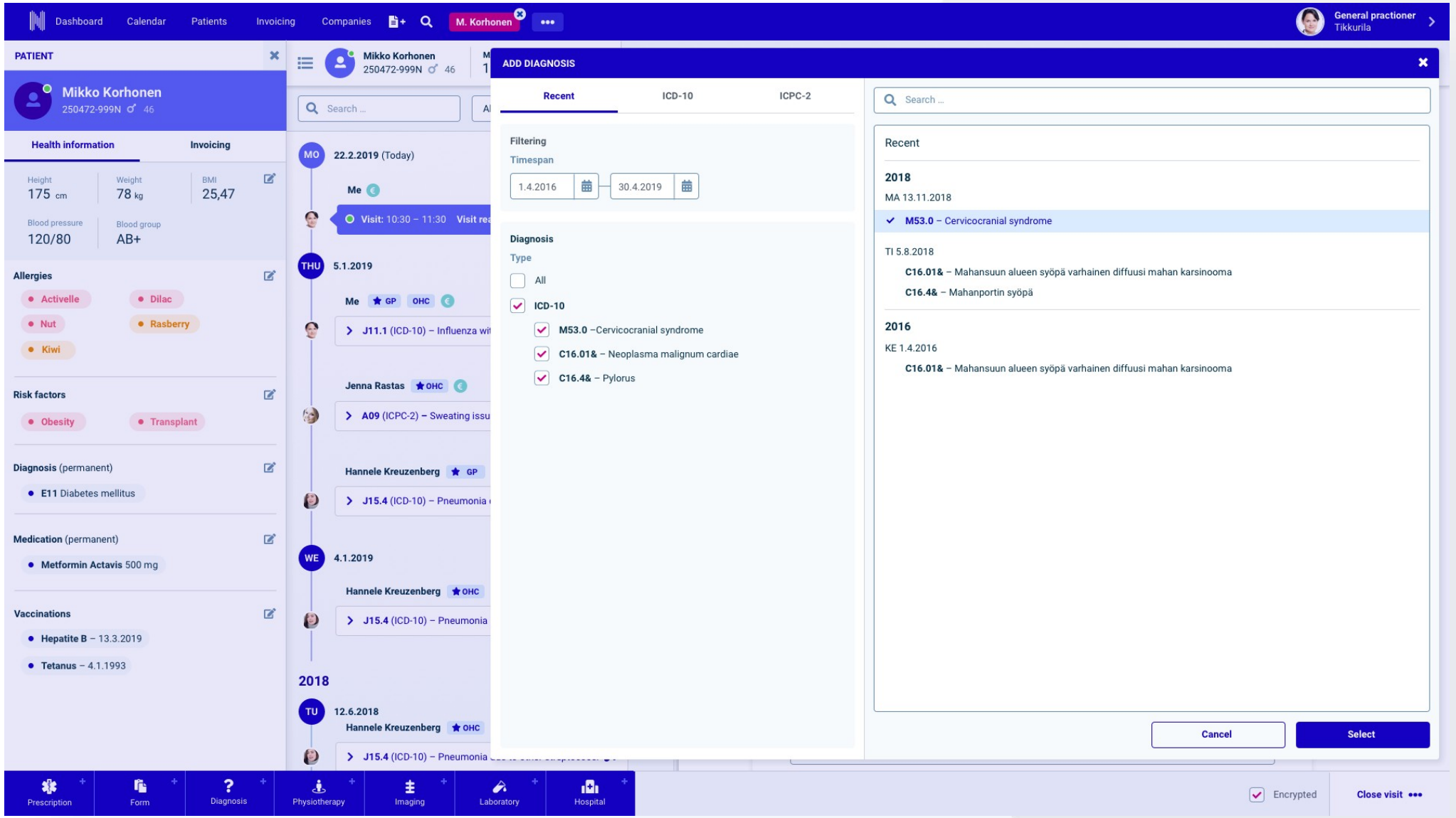

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CRM

360 CUSTOMER VIEW

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CONSUMER

INSURANCE CONTRACTS

PARENT

TRUSTEE

EMPLOYEE

COMPANY DECISION-MAKER

ERP (€)

CLINICAL

BI

INCREASE SALES WITH BETTER CUSTOMER EXPERIENCE

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Roles of automation, analytics and AI

SIGNIFICANT — SUPPORTIVE

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ERP

KEY AREAS

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- Financial management
- Fixed assets
- Accounts ledger
- Cashier
- Project management
- Product information management
- Warehouse management
- Acquisition

HOW WE WORK

- No customization, but parametrization of the Dynamics 365 Finance and Operations product
- Microsoft FastTrack support during the implementation phase
- Development principles:
  - Do not customize product internals
  - Develop only based on extension points provided by Microsoft
  - Leverage interfaces and build custom microservices “on-the-side”

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ANALYTICS

DATA ANALYTICS SERVICES

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Comprehensive data specialist team

- Data Engineers
- Data Scientists
- Business SME
- Application Developers

Data platform services

- Data Ingestion
- Data Exploration / Visualization
- Data Transformation
- Modelling
- Deployment & Production

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INTEGRATIONS & DEVOPS

ENTERPRISE ARCHITECTURE, INTEGRATIONS & DEVOPS

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- Domain-Driven Design and Domain APIs
- Microservices architectures
- DevOps and Cloud Native development
- Hybrid cloud solutions

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API-DRIVEN ARCHITECTURE PRINCIPLES

1. PRODUCT-BASED ARCHITECTURE

- Product-based but product-agnostic architecture
- Leverage proven COTS products where applicable
- Favor products that expose high-quality APIs
- Avoid complex tailoring of COTS products

2. MICROSERVICES ARCHITECTURE

- Smart endpoints and dumb pipes
- Lightweight API Management over heavy ESB
- Keep number of services manageable
- Extend products beyond their original capabilities

3. DOMAIN-BASED ARCHITECTURE

- Define architectural domains
- Expose Domain APIs
- Speak the same language as API consumers
- Hide the complexity of underlying products

4. CLOUD-BASED ARCHITECTURE

- Do not fear the cloud, embrace it
- Highly-certified best-of-breed data centers
- Improved flexibility, productivity and stability
- Enhanced security against cyber attacks

REFERENCE ARCHITECTURE (HYBRID CLOUD)

AZURE CLOUD

PUBLIC SERVICES (INTERNET)

ACCESS MANAGEMENT
- Firewall (Simple)
- API Management

CONTAINERS
- Kubernetes
- App Service

MESSAGING & EVENTS
- Service Bus
- Event Grid
- Event Hubs

STORAGE & CACHE
- SQL Database
- Cosmos DB

LOGGING & MONITORING
- Log Analytics
- Application Insights
- Monitor

PRIVATE SERVICES (INTERNAL VNET)

ACCESS MANAGEMENT
- Virtual Network
- Firewall (Advanced)
- API Management
- App Service Environment

CONTAINERS
- Kubernetes
- App Service

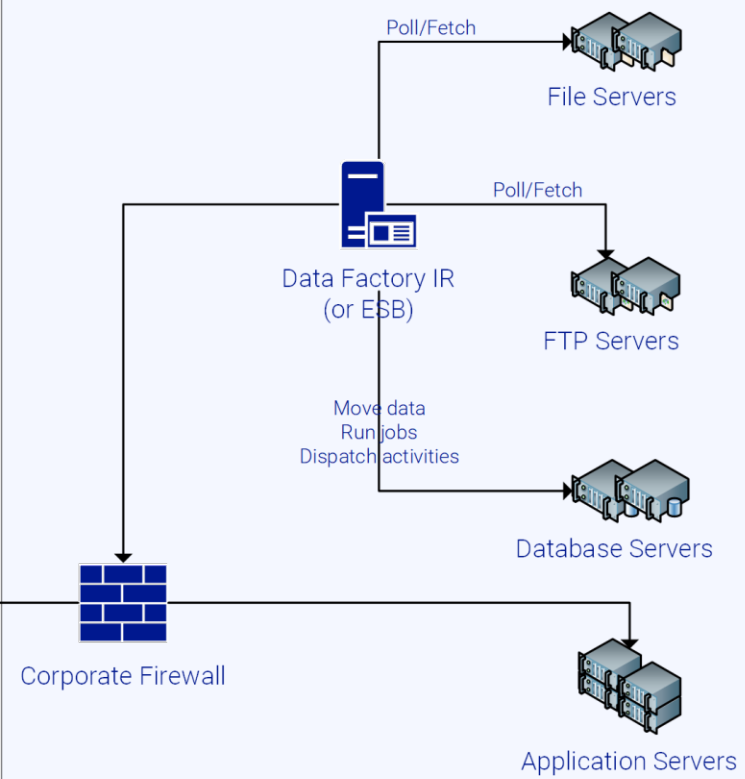
MESSAGING & EVENTS
- Service Bus
- Event Grid
- Event Hubs

STORAGE & CACHE
- SQL Database
- Cosmos DB
- Storage Blob
- Redis
- Data Warehouse
- Data Lake

LOGGING, MONITORING & ANALYTICS
- Log Analytics
- Application Insights
- Monitor
- Data Lake Analytics
- HDInsight
- Databricks

ORCHESTRATION
- Logic Apps
- Functions
- Data Factory

ON-PREMISE



REFERENCES

HEALTHCARE REFERENCES

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	Largest University Hospitals in Estonia and Lithuania
	+30 Clinics in Baltic countries
Lietuvos Respublikos sveikatos apsaugos ministerija	National Electronic Health Record in Lithuania
	UAE Daman Thiqa & inHealth digital prescription
TBA	Private Healthcare Providers in Finland

THANK YOU

Let`s start working together!
I have 17 years of expertise in social healthcare ICT solutions

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