

1

Cognitive Assistants & Knowledge Worker Productivity



- General conversational **assistant** (Q&A, brainstorming, rephrasing, translation).
- Document **summarization**, key information **extraction**, report **writing**.
- **Writing assistance** (emails, reports, presentations, specifications).
- **Office productivity copilots** (Word, Excel, PowerPoint, Outlook, etc.).
- Vertical **business copilots** (legal, finance, sales, IT, etc.).
- **Agentic workflows** (agent chains with planning, memory, auto-correction).
- **Multimodality** (text + image + audio in the same stream).

PATTERNS & AI APPROACHES

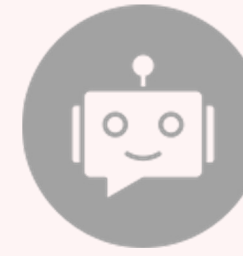
- Generalist LLMs (text/code) + specialized business LLMs.
- Multimodal LLMs (text + image + sometimes audio/video).
- RAG (Retrieval-Augmented Generation) based on internal document databases.
- Fine-tuning/adapters (LoRA, QLoRA, etc.) for jargon and business style.
- Tool/function calling to trigger actions (search, system queries, workflows).
- Agent orchestration frameworks (agent graphs, memory, tools).

SOLUTIONS & OFFERINGS

- Managed LLM services (OpenAI, Azure OpenAI, Anthropic, Mistral, xAI API, Google Gemini, Amazon Bedrock, Cohere, Perplexity API, etc.).
- Augmented office suites (Microsoft 365 Copilot, Google Workspace AI, Notion AI, Zoho Workplace, Dropbox AI, etc.).
- Enterprise Search and Q&A AI solutions (RAG platforms, augmented search).
- Vertical business copilots (sales, dev, legal, etc.).
- Agents integrated into the OS/browser (Windows Copilot, macOS Intelligence, browser copilots).

2

Content Generation (Text, Code, Image, Audio, Video)



- **Marketing copywriting** (posts, campaigns, landing pages, emails).
- **Business document generation** (contracts, product sheets, initialized reports).
- **Programming assistance** (code copilots, test generation, refactoring).
- **Complete dev chain**: code + tests + documentation.
- **Creation of images**, mockups, and graphic assets.
- **Speech synthesis**, dubbing, **video avatars**, and generative video training.
- **Localization and multilingual/cultural adaptation** of content.

PATTERNS & AI APPROACHES

- LLM for text and code (transformers, instruction-tuning).
- Generative models for images and video (diffusion, generative video).
- Speech synthesis and voice cloning models (encoder-decoder, speech diffusion).
- Orchestration of development agents (planning, generation, execution, validation).
- RAG / grounded generation based on internal knowledge bases.
- Self-evaluation loops.

SOLUTIONS & OFFERINGS

- Augmented code assistants/IDEs (GitHub Copilot, VS Code, JetBrains, Cursor, Codeium, Tabnine, Amazon CodeWhisperer, Windsurf, OpenAI Codex, Claude Artifacts/Claude for coding, Google Gemini Code Assist, VS IntelliCode, etc.).
- AI-first text generation and marketing tools (Jasper, Copy.ai, etc.).
- Image/video generation tools (Midjourney, Leonardo, Runway, etc.).
- AI video & voice platforms (Synthesia, HeyGen, dubbing/speech tools).
- Music generation tools (Suno, Udio, Stable Audio, Adobe Firefly Audio, etc.).

3

Customer Service Self-Care & Front Office



- Customer service **chatbots and voicebots** (FAQ, order tracking, after-sales support).
- **Automatic sorting** of emails and tickets, **assisted responses** for agents.
- **Real-time assistance for advisors** (response suggestions, next best action, surfacing relevant knowledge).
- **Analysis of customer verbatim feedback**, **NPS**, and open-ended feedback.
- **Voice AI** (voice cloning, adaptive prosody, emotion detection).
- **Omnichannel journey** with cross-channel customer memory (consolidated history).

PATTERNS & AI APPROACHES

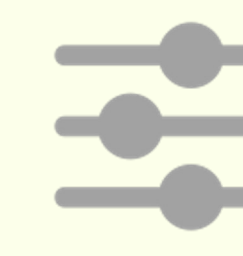
- "Classic" NLP (intent detection, NER, classification).
- Dialogue-oriented LLM, orchestrated with business rules and back-end systems.
- Orchestration of support agents (bot → escalation → summary for humans).
- Speech-to-text and text-to-speech for voice channels.
- Sentiment analysis, thematic clustering, emotion AI.
- Conversation intelligence/quality AI (use of models to analyze calls/chats en masse, extract themes, detect risks, etc.).

SOLUTIONS & OFFERINGS

- Augmented contact center platforms / Contact Center AI (Genesys Cloud CX, Five9, Amazon Connect, NICE CXone, Cisco Webex Contact Center, Talkdesk, RingCentral Contact Center, etc.).
- Customer support tools with integrated AI (Zendesk AI, Intercom, Salesforce Service Cloud + AI, ServiceNow Customer Service Management, HubSpot Service Hub, Zoho Desk, etc.).
- Low-code/no-code bot platforms or frameworks on LLM APIs.
- Voice AI platforms (inbound/outbound calls, voicebots).

4

Personalization, Recommendation & Engagement



- **Product, content, and offer recommendation**.
- **Price personalization, discounts, and incentives**.
- Web/app **journey personalization**, targeted **marketing automation**.
- **In-app and in-product personalization**.
- **Cross-sell/up-sell, dynamic bundles, next best offer**.
- Improved internal **search engines** (learning-to-rank).
- **LLM-driven personalization** (dynamic content in real time).

PATTERNS & AI APPROACHES

- Collaborative filtering, matrix factorization, user/object embeddings.
- Sequential models (transformers on browsing/purchase histories).
- Multi-armed bandits and RL for online optimization (continuous testing).
- Hybrid content + behavior models.
- Unified embeddings (text + product + behavior) for search and recommendation.
- RAG + LLM to personalize generated content (text, creative, offers).
- Recommendation based on graphs/knowledge graphs.

SOLUTIONS & OFFERINGS

- Cloud or SaaS recommendation engines (Amazon Personalize, Google Recommendations AI, Microsoft Azure Personalizer, Algolia Recommend, etc.).
- Integrated e-commerce/media modules (Shopify, Salesforce Commerce Cloud, Adobe Commerce – formerly Magento, etc.).
- CDP and marketing hubs with AI: segmentation, cross-channel orchestration (Twilio Segment, mParticle, Tealium, etc.).
- Internal developments (TensorFlow Recommenders, recommendation libraries, real-time pipelines).
- Search & discovery platforms (Elastic, Algolia, Coveo, etc.).

5

HR, Recruitment, Learning & People Analytics



- **Resume/job matching**, **intelligent screening** of applications.
- **Help with writing job descriptions**, structured **interview guides**.
- **Engagement and social climate analysis** (surveys, verbatim).
- **Workforce planning**, forecasting skills requirements.
- Detection of deepfakes and **manipulation in video interviews**.
- **Copilots for managers and employees** (HR policies, mobility, training, internal Q&A).

PATTERNS & AI APPROACHES

- NLP for resumes, profiles, job descriptions (embeddings, classification, similarity).
- Profile ↔ job recommendation engines.
- Predictive models based on HR data (attrition, mobility, performance).
- LLM for HR copilots (FAQs, internal policies, HR content generation).
- Audio/video deepfake detection models.
- Skills graphs and GNNs (Graph Neural Networks).

SOLUTIONS & OFFERINGS

- ATS and HRIS with AI recruiting and internal mobility (Workday HCM / Workday Peakon, SAP SuccessFactors, Oracle Fusion Cloud HCM, UKG Pro, Darwinbox, Greenhouse, BambooHR, Rippling, etc.).
- Survey analysis tools and employee verbatim (Culture Amp, Microsoft Viva Glint, Workday Peakon Employee Voice, Qualtrics Employee Experience, etc.).
- HR assistants on LLMs + internal document databases – HR copilots (Leena AI, Moveworks, Barista, Rezolve.ai, etc.).
- Security and deepfake detection solutions for sensitive HR processes (Reality Defender, Pindrop, Onfido/Jumio, etc.).

6

Operations, Supply Chain & Industry



- **Predictive maintenance** (machines, vehicles, infrastructure).
- **Demand forecasting and inventory optimization**.
- **Production planning, scheduling, logistics routing**.
- **Planning and sizing of operational human resources**.
- **Energy optimization and facility management** (buildings, data centers).
- **Waste reduction and quality optimization**.
- **Digital twins** + RL for closed-loop control.

PATTERNS & AI APPROACHES

- ML on time series and IoT data (sensors, logs).
- Advanced forecasting models (deep forecasting).
- Operational research (mathematical programming, heuristics, metaheuristics).
- RL and combinatorial optimization on digital twins.
- LLM as a cockpit layer (questioning OT/IoT/MES in natural language).
- Model Predictive Control (MPC) enriched by ML/surrogate models.

SOLUTIONS & OFFERINGS

- Vertical solutions for predictive maintenance and industrial optimization (SAP Asset Perf. Management (APM) and SAP Predictive Maintenance & Service, Oracle Predictive Maintenance, Manhattan Active Warehouse, AspenTech, etc.).
- IoT/edge platforms with ML capabilities (AWS IoT Greengrass, MS Azure IoT Edge, Google Cloud IoT + Coral/Edge TPU, NVIDIA Jetson, IBM Edge App. Manager, etc.).
- Optimization tools and solvers (Gurobi, CPLEX, FICO Xpress, SCIP, Google OR-Tools, etc.) coupled with twins.
- Simulation environments (industrial digital twins from major industrial vendors).

7

Analytics, Scoring & Decision Support



- **Risk scores** (credit, fraud, churn, unpaid bills, attrition).
- **Volume predictions** (sales, traffic, incidents, workload).
- **Anomaly detection** (IT, operations, data quality).
- **Marketing decision support** (purchase propensity, segmentation, targeting).
- **Causal ML** to measure the real impact of actions (campaigns, pricing, channels).
- **LLM as a conversational data analyst** (querying a data warehouse in natural language).

PATTERNS & AI APPROACHES

- Supervised tabular ML (gradient boosting, forests, networks, tabular transformers).
- Time series models (classical + deep learning, time series transformers).
- Unsupervised ML (clustering, anomaly detection).
- Causal inference (structural models, uplift, counterfactuals).
- Predictive + causal + prescriptive chain (optimization/simulation).
- LLM + SQL + RAG on data warehouse for conversational analytics.

SOLUTIONS & OFFERINGS

- Data science & MLOps platforms (Databricks, Dataiku, H2O.ai, SageMaker, Snowflake + Snowpark/Cortex, Azure Machine Learning, Google Cloud Vertex AI, etc.).
- Augmented BI tools (ThoughtSpot, Tableau AI, Power BI Copilot, Qlik Sense / Qlik Cloud, SAP Analytics Cloud, Oracle Analytics Cloud, Looker – Google Cloud, etc.).
- AutoML tools for structured data.
- Internal developments (Python, scikit-learn, XGBoost/LightGBM, PyTorch, TensorFlow, JAX, Prophet, statsmodels, darts, DoWhy, causal ML libraries, etc.).

8

Computer Vision & the Physical World



- Automated **quality control** on production lines.
- **Document reading and comprehension** (advanced OCR, forms, invoices).
- Intelligent **video surveillance** (object detection, behavior detection, security).
- **Robotics, autonomous vehicles, drones** (perception, navigation).
- Assisted **medical imaging** (detection, segmentation, triage).
- **Vision-Language Models (VLM)** for captioning, questioning scenes, guiding in AR/maintenance.
- **Edge AI for critical latency** (industry, retail, embedded).

PATTERNS & AI APPROACHES

- CNN and vision transformers for classification, detection, segmentation.
- Real-time detection/segmentation architectures (YOLO, DETR, SAM families, etc.).
- Intelligent OCR + document-oriented models (layout, structure, language).
- SLAM, trajectory planning, and RL for robotics.
- VLM (vision + language) for natural interaction with what is seen.
- Self-supervised learning and foundation models (CLIP-like models, Masked Autoencoders, SimCLR, etc.).

SOLUTIONS & OFFERINGS

- Libraries & frameworks (OpenCV, PyTorch/TensorFlow vision, detection/segmentation frameworks).
- Vertical solutions (industrial inspection, medical imaging, smart cities, etc.).
- No-code vision platforms (annotation, training, deployment).
- Edge and embedded platforms (NVIDIA Jetson, smart cameras, cloud edge solutions).
- Managed vision services as Cloud APIs (Google Cloud Vision AI, AWS Rekognition, Azure Computer Vision, etc.).

9

Security, Fraud, Compliance & Risk



- **Fraud detection** (payments, e-commerce, insurance).
- **Anti-money laundering (AML)**, transaction and counterparty screening.
- **Intrusion and threat detection** (cyber, SIEM/SOC).
- **Security posture monitoring and data leak detection**.
- Document **compliance control** (KYC, contracts, regulations).
- **Attack and robustness testing** (adversarial ML, prompt injection, data poisoning).

PATTERNS & AI APPROACHES

- Scoring models and anomaly detection (supervised/unsupervised).
- Graph modeling (GNN, graph-based features) on transaction/relationship networks.
- NLP on documents (entity extraction, clauses, risk classification).
- Combination of business rules + ML/LLM models (hybrid systems).
- AI security techniques (attack detection, robustness, filtering).
- Learning representations/embeddings on logs and events for anomaly detection.

SOLUTIONS & OFFERINGS

- Fraud detection and AML engines integrated into financial systems (FICO Falcon Fraud Manager, NICE Actimize, SAS Fraud Management / SAS AML, Feedzai, etc.).
- Cyberdefense/SIEM platforms with augmented AI SOC (Splunk Enterprise Security, MS Sentinel, IBM QRadar SIEM, CrowdStrike Falcon, Elastic Security, etc.).
- KYC/compliance document extraction and processing tools (Hyperscience, ABBYY, Rossum, Kofax, OpenText, UiPath Document Understanding, etc.).
- Adversarial ML testing and robustness platforms (Robust Intelligence, Calypso AI, Microsoft Counterfit, etc.).

10

Innovation, Research & Development



- **Accelerated exploration of scientific literature**, patents, and standards.
- **Discovery of new hypotheses, correlations, and formulations**.
- **Assisted design** (molecules, materials, circuits, components).
- **AlphaFold-type protein structure models** applied to other complex fields.
- **Auto-design of experiments** (suggestion of protocols, test plans, test campaigns).
- **Automated mapping of technology** and patent landscapes/patents (IP landscaping).

PATTERNS & AI APPROACHES

- Specialized LLM (scientific, medical, legal) + RAG on technical corpora.
- Generative models for structures (molecules, materials, designs).
- Surrogate modeling to accelerate costly simulations.
- Bayesian optimization and RL to design and select experiments.
- Scientific knowledge graphs and GNN.
- Hybrid physics-informed models (physics-informed ML and symbolic regression).

SOLUTIONS & OFFERINGS

- Augmented research platforms – scientific Q&A, patent exploration (Elicit, Consensus, Scite, ResearchRabbit, Explainpaper, etc.).
- Vertical tools – drug discovery, materials design, electronic design (Exciscientia, BenevolentAI, Insilico Medicine, Recursion, Atomwise, Deep Genomics, Valo Health, etc.).
- Environments integrating HPC + ML + LLM (advanced R&D stacks).
- Materials/chemistry (Citrine Informatics, Mat3ra, MaterialsZone, Nexus, Exabyte, etc.).
- Lab automation/robotization platforms (Emerald Cloud Lab, Strateos, etc.).

11

Governance, Ethics & Responsible AI



- **Model auditing** (bias, performance, drift, explainability).
- **Regulatory compliance** (GDPR, AI Act, NIST, internal frameworks).
- Generation and updating of **responsible AI policies, impact reports**.
- **Production monitoring** (drift, incidents, unexpected behavior).
- **Watermarking and detection of generated content, detection of deepfakes**.
- Systematic **red teaming** of models (LLM & others).
- **Mapping of use cases** and classification according to risk levels (AI Act, internal).

PATTERNS & AI APPROACHES

- XAI (SHAP, LIME, Integrated Gradients, counterfactuals) for classic and deep models.
- Specific LLM metrics (hallucinations, toxicity, jailbreak rate, safety scores).
- Deepfake detection models (audio, image, video, text).
- Statistical monitoring (data/performance drift, alerts).
- Risk and compliance analysis tools (risk scoring, rules + ML).
- LLM-as-a-judge and automated red teaming.

SOLUTIONS & OFFERINGS

- MLOps/ModelOps platforms with governance and observability (more geared towards "classic" ML models).
- LLM/agent governance platforms (evaluation, red teaming, policy enforcement).
- AI Act/Responsible AI compliance tools (risk registry, DPIA, documentation).
- Watermarking and detection solutions for generated content and deepfakes.
- RegTech AI for regulatory monitoring and business compliance.
- GRC and data governance suites extended to AI.

12

Infrastructure, Enablement & Cross-Functional Tools



- **Management of prompts, agent workflows**, and tools called by LLM.
- **Storage and vector search** (knowledge bases, RAG, similarity search).
- **Feature stores** for traditional models.
- **Observability, logging, tracing, model and agent evaluation**.
- **Pipeline** (data, ML, LLM) and job **orchestration**.
- **Multi-vendor model abstraction and routing**.

PATTERNS & AI APPROACHES

- Agent and chain orchestration (graphs, planners, memory).
- Hybrid indexing (BM25 + vectors) and large-scale embeddings.
- Offline/online evaluation metrics (A/B, bandits) for models and agents.
- Real-time monitoring (latency, cost, quality, security).
- Adaptive model and tool routing (bandits, meta-learning).
- Auto-tuning of prompts, RAG, and pipelines through optimization.

SOLUTIONS & OFFERINGS

- LLM/agent orchestrators and frameworks (LangChain, LangGraph, Semantic Kernel, Llamaindex, AutoGen, CrewAI, OpenAI Agent SDK, n8n AI Builder, Temporal, Airflow, Dagster, Zapier, Make, etc.).
- Vector DB and search engines (Weaviate, Pinecone, OpenSearch, Qdrant, Chroma, Elasticsearch, PostgreSQL + pgvector, etc.).
- Feature stores (Feast, Tecton, Hopsworks, SageMaker, Databricks Feature Store, etc.).
- Data catalogs and governance (Collibra, Informatica, etc.).
- Observability and evaluation tools for LLMs & ML – tracing, quality scoring, replay (Arize AI, LangSmith, Braintrust, Langfuse, etc.).