

Strategy & Competitiveness

AI in Management Playbook:

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Executive Summary

The central argument of this article is: AI is not an IT tool; it is a new production function for prediction, decision-making, learning, coordination, and innovation.

AI-native firms scale through an “AI factory” built around data, algorithms, experimentation, and platforms; value depends on enterprise maturity, leadership, governance, and reusable digital capabilities.

Theme 1 — AI as an Industrial Revolution

Strategic idea

AI should be taught as a general-purpose technology like electricity, computing, or the internet. The Jevons logic is critical: when prediction, generation, coding, diagnosis, design, or coordination becomes cheaper, firms do not use less of it; they use far more of it, in places where it was previously uneconomic. Jevons made this point about coal efficiency in 1865; Wardley's mapping logic similarly treats technologies as evolving from custom novelty to commodity utility, enabling new higher-level innovation.

AI tools and techniques

Business question	AI technique	Data required	Purpose	How to exploit
Where will AI create new demand?	Opportunity mapping, value-chain AI mapping, Wardley maps	Process maps, cost structure, customer journeys, pain points, transaction volumes	Identify where cheap prediction/generation changes economics	Prioritize use cases where AI changes scale, speed, personalization, or marginal cost
Which tasks become newly economical?	Task decomposition, prediction-machine analysis	Job descriptions, decision logs, service tickets, approval workflows	Break work into prediction, judgment, action, feedback	Redesign roles and workflows, not just automate tasks
Which customer needs can be served differently?	GenAI ideation, synthetic personas, recommender systems	CRM, usage data, complaints, market research, call transcripts	Discover unmet demand and personalized offerings	Build AI-enabled services, subscriptions, dynamic bundles
Which assets can become platforms?	Knowledge graphs, APIs, embeddings, vector search	Product data, customer data, engineering data, partner data	Turn proprietary data into reusable AI infrastructure	Create ecosystem services, developer tools, partner interfaces
Where can AI reduce coordination costs?	AI agents, workflow orchestration, RPA + LLMs	SOPs, emails, ERP/CRM records, tickets, policies	Automate handoffs, monitoring, documentation, follow-up	Move from functional silos to intelligent process flows

Classifiers and predictive models

Students should learn that “classifier” means more than a technical tool. It is a strategic instrument for sorting the world into action categories.

Examples:

Classifier	Prediction target	Data	Managerial action
Churn classifier	Which customers are likely to leave?	Purchase history, service tickets, usage, NPS, contract data	Retention offers, service recovery, account escalation

Lead-scoring classifier	Which prospects will convert?	CRM, website behavior, firmographics, email engagement	Sales prioritization, personalized outreach
Fraud classifier	Which transaction or claim is suspicious?	Claims history, images, documents, device metadata, network patterns	Investigation, manual review, payment hold
Failure classifier	Which machine is likely to fail?	IoT sensors, vibration, temperature, maintenance logs	Predictive maintenance, spare parts planning
Quality classifier	Which product is defective?	Vision data, process parameters, operator logs	Inline inspection, root-cause analysis
Credit/default classifier	Which borrower may default?	Financial history, income, payment behavior, macro data	Pricing, underwriting, risk limits

Industry examples

Automotive. AI can predict component failure, optimize EV battery supply, personalize in-car services, support autonomous-driving perception, and improve supply-chain resilience. Automotive AI also shows the Jevons effect: cheaper prediction may increase use of simulation, testing, software-defined features, and autonomous services rather than merely reducing labor. Recent automotive AI examples include supply-chain control towers, AI forecasting, predictive maintenance, and in-vehicle AI accelerators.

Healthcare. AI creates value in triage, diagnostic support, clinical workflow automation, patient risk stratification, and administrative burden reduction. But healthcare also shows the governance challenge: bias, transparency, and clinical accountability are central, because model errors affect patient outcomes.

Pharma. AI expands the search space for drug discovery, target identification, molecule generation, clinical-trial design, and pharmacovigilance. Recent literature describes AI across the drug-development workflow, from disease targets to post-market surveillance.

Insurance. AI transforms underwriting, fraud detection, pricing, claims automation, and customer service. Fraud classifiers use anomalies, text, images, claims histories, and network patterns to flag suspicious claims.

Manufacturing. Siemens frames digital twins plus industrial AI as a foundation for continuous optimization and predictive maintenance. The key data are operational data, sensor data, engineering models, and maintenance histories.

Theme 2 — Rewiring how firms learn, decide, and compete

Strategic idea

The firm becomes an AI learning system. Competitive advantage shifts from static resources to the capacity to sense, predict, decide, act, and learn faster than rivals. Iansiti and Lakhani call this the AI factory: data pipelines, algorithms, experimentation platforms, and operating processes that continuously improve decisions.

McAfee and Brynjolfsson's Machine, Platform, Crowd lens is useful here: machine changes automation and prediction; platform changes scale and ecosystems; crowd changes innovation and distributed intelligence.

AI operating model

Layer	What it contains	AI techniques	Strategic purpose
Data layer	ERP, CRM, IoT, clinical, claims, R&D, supply-chain data	Data engineering, feature stores, data quality monitoring	Create reusable enterprise memory
Intelligence layer	Models, classifiers, LLMs, optimization engines	ML, deep learning, GenAI, agentic workflows, causal inference	Convert data into predictions and recommendations
Decision layer	Human judgment, policies, approval rights	Decision trees, simulation, decision intelligence	Decide who acts: human, machine, or hybrid
Learning layer	Feedback loops, A/B tests, model monitoring	Experimentation, reinforcement learning, MLOps	Improve over time
Governance layer	Risk, ethics, compliance, accountability	XAI, bias testing, audit trails, model cards	Make AI trustworthy and board-legible

Decision economics

AI creates value when managers decompose decisions into:

- Prediction — What is likely to happen?
- Judgment — What outcome do we value?
- Action — What will we do?
- Feedback — What did we learn?

That is the managerial core of *Prediction Machines*: AI lowers the cost of prediction, which changes the value of complements such as judgment, data, and action design.

Core tools and techniques

Managerial capability	Tools	Data	Purpose
Strategic sensing	LLM-based market intelligence, weak-signal detection, topic modeling	News, patents, earnings calls, social media, customer feedback	Detect shifts earlier
Forecasting	Time-series models, gradient boosting, probabilistic forecasting	Sales, inventory, macro data, seasonality, promotions	Demand planning, capacity, capital allocation
Decision support	Classifiers, causal models, uplift models	Historical decisions, outcomes, treatment/control data	Recommend actions, not just predictions

Experimentation	A/B testing, multi-armed bandits	Digital behavior, conversion, engagement, operational metrics	Learn what works
Knowledge management	RAG, vector databases, enterprise search	Policies, manuals, contracts, project documents, research	Make institutional knowledge usable
Process intelligence	Process mining, task mining, agentic automation	Event logs, ERP timestamps, ticket flows	Identify bottlenecks and automate workflows
Ecosystem strategy	Platform analytics, network analysis	Partner activity, API usage, marketplace data	Govern network effects and complementors

Industry examples

Automotive. AI rewires the car company into a software and data company. Data from vehicles, dealerships, supply chains, and charging infrastructure becomes a learning loop for product design, after-sales service, autonomous systems, and demand forecasting.

Healthcare. Hospitals can use classifiers to predict readmission, sepsis risk, no-shows, length of stay, and resource demand. The key challenge is not only accuracy; it is workflow integration, clinician trust, explainability, and liability.

Pharma. AI changes R&D portfolio management. Firms can classify drug candidates by probability of technical success, predict trial recruitment risk, simulate patient cohorts, and mine scientific literature. EMA's review of AI/ML in the medicines lifecycle highlights both current applications and regulatory challenges.

Insurance. Insurers become prediction businesses: risk selection, pricing, fraud detection, claims severity, litigation risk, and customer lifetime value. The board-level question is whether AI improves risk pooling or creates unfair discrimination.

Manufacturing. The AI factory becomes literal: digital twins, predictive maintenance, quality inspection, production scheduling, energy optimization, and autonomous process control. Siemens emphasizes the combination of digital twins, operational data, AI analytics, and predictive maintenance.

THEME 3 — The AI Playbook

Strategic idea

The MBA deliverable should be an AI Transformation Playbook. It should force students to move from aspiration to operating design.

The playbook has three modules:

1. AI Readiness & Strategy
2. Technology, Prototyping & Execution
3. Governance, Ethics & Implementation

MIT CISR's work is useful here because it distinguishes technology maturity from organizational maturity. Future-ready firms develop reusable capabilities across customer experience, operations, data, platforms, and leadership.

Module 1 — AI Readiness & Strategy

Deliverables

AI Readiness Assessment + AI Vision Statement

Assessment area	Questions
Strategic ambition	Are we using AI for cost, growth, innovation, resilience, or ecosystem control?
Data readiness	Do we have clean, accessible, governed data?
Process readiness	Are workflows standardized enough to automate or augment?
Talent readiness	Do managers understand AI sufficiently to challenge vendors and technical teams?
Governance readiness	Who owns risk, ethics, model approval, and monitoring?
Value readiness	Can we link AI use cases to revenue, margin, risk, or speed?

Tools

Tool	Data required	Purpose
AI opportunity portfolio	Process maps, financial KPIs, pain points	Rank use cases by value and feasibility
Data asset inventory	Data catalog, ownership, quality metrics	Identify reusable AI assets
Capability maturity model	Interviews, surveys, architecture review	Diagnose readiness gaps
Use-case value tree	P&L drivers, operational KPIs	Translate AI into business value
Risk heat map	Regulatory, ethical, cyber, operational risks	Identify board-level exposure

Module 2 — Technology, Prototyping & Execution

Deliverables

Use Case Map + Technical Brief + Prototype Demo

AI family	Techniques	Data	Example uses
Predictive AI	Classification, regression, forecasting, anomaly detection	Structured business data, sensor data, claims, transactions	Churn, fraud, default, maintenance, demand
Generative AI	LLMs, multimodal models, RAG, summarization	Documents, policies, contracts, research, images	Copilots, knowledge search, document generation

Agentic AI	Tool-using agents, workflow orchestration, planning systems	APIs, SOPs, enterprise apps, approval rules	Claims handling, procurement, sales support
Optimization AI	Linear programming, reinforcement learning, simulation	Constraints, costs, demand, capacity	Scheduling, routing, inventory, production
Causal AI	Causal inference, uplift modeling, experiments	Treatment/control data, interventions, outcomes	Which action causes improvement?
Computer vision	CNNs, vision transformers, multimodal models	Images, video, scans, inspection data	Defect detection, radiology support, damage assessment
Knowledge AI	Knowledge graphs, embeddings, semantic search	Ontologies, documents, product data	Enterprise memory, R&D discovery, compliance

Prototype discipline

Every prototype should answer:

1. What decision will improve?
2. Who uses the model?
3. What data does it need?
4. What action does the prediction trigger?
5. What KPI changes?
6. What risk could go wrong?
7. How will the model learn after deployment?

Module 3 — Governance, Ethics & Implementation

Deliverables:

Governance Framework + Implementation Roadmap + Final AI Transformation Playbook

Governance domain	Mechanism
Accountability	Named model owner, business owner, risk owner
Transparency	Model cards, documentation, explainability reports
Bias and fairness	Subgroup performance testing, fairness metrics, review board
Human oversight	Human-in-the-loop rules for high-risk decisions

Security	Data access controls, prompt-injection testing, vendor risk review
Compliance	Regulatory mapping, audit trail, data-retention policy
Monitoring	Drift detection, performance dashboards, incident response
ROI	Benefits tracking, adoption metrics, cost-to-serve, cycle-time reduction

Healthcare and insurance require especially strong governance because AI can affect access, pricing, diagnosis, treatment, or claims outcomes. Recent healthcare AI literature emphasizes accountability, transparency, bias, and the uncertainty of patient-relevant outcomes.

Board-level questions to ask

- Where does AI change the economics of our business, not just our efficiency?
- Which decisions become better, faster, cheaper, or more scalable?
- What proprietary data advantage do we have?
- Are we building isolated pilots or a reusable AI factory?
- What must change in roles, incentives, workflows, and governance?
- What are the failure modes: bias, hallucination, opacity, cyber risk, model drift, over-automation?
- How will we know whether AI created value?
- What should remain human judgment?
- Which ecosystem position do we want: platform owner, complementor, data provider, model user, or infrastructure partner?
- What capability will competitors find hard to copy?

Integrative MBA Board Simulation Project: Governing an AI-Powered Enterprise

Deliverable 1 — AI Strategic Diagnosis

You analyze:

Industry disruption

- How AI changes competitive dynamics
- Which activities become commoditized
- New entrants and ecosystem threats

Economic transformation

Students apply:

4. Prediction Machines
5. AI Factory
6. Wardley mapping
7. Machine Platform Crowd

Deliverable 2 — AI Opportunity Portfolio

You identify:

8. High-value use cases
9. Required data assets
10. Technical feasibility
11. Organizational feasibility
12. Financial impact

Required AI use case categories

Category	Example
Predictive AI	churn, maintenance, fraud
Generative AI	copilots, document generation
Optimization AI	scheduling, logistics
Agentic AI	autonomous workflows
Decision Intelligence	strategic dashboards

Deliverable 3 — Enterprise AI Operating Model

Students design:

AI Factory

- data pipelines
- model layer
- governance layer
- experimentation layer

Organization

- centralized vs federated AI teams
- AI Center of Excellence

- operating governance

Talent strategy

- reskilling
- AI literacy
- new executive roles

Deliverable 4 — Governance & Risk Framework

Students create:

- AI governance structure
- ethical principles
- model approval process
- human oversight rules
- AI audit procedures
- incident response framework

Required risk dimensions

Risk	Example
Bias	discriminatory underwriting
Hallucination	incorrect medical advice
Cybersecurity	prompt injection
Model drift	degraded forecasting
Systemic dependence	vendor lock-in
Workforce backlash	labor resistance
Regulatory risk	GDPR, FDA

Deliverable 5 — Capital Allocation Memo

You receive a constrained budget.

Example:

- €3B transformation budget
- competing priorities
- uncertain ROI

You must decide:

- which AI initiatives to fund
- which to delay
- which to terminate

This forces strategic trade-offs.

Deliverable 6 — Crisis Simulation

At mid-course, teams receive a breaking event.

- Example: crisis events:
 - Automotive: Autonomous-driving fatality
 - Healthcare: AI triage system misclassifies patients
 - Pharma: Regulator rejects AI-generated trial methodology
 - Insurance: Media exposes discriminatory pricing model
 - Manufacturing: AI factory shutdown after cyberattack

Crisis response requirements

1. Assess exposure
2. Manage communications
3. Coordinate stakeholders
4. Redesign governance
5. Protect enterprise legitimacy

Required presentation sections

1. Strategic Vision: How AI changes industry economics
2. AI Transformation Roadmap: 3-year roadmap
3. AI Operating Model: Technology + organization + governance
4. Financial Logic: ROI, productivity, growth, resilience
5. Risk & Governance: Ethics, compliance, accountability
6. Organizational Change: Talent and culture transformation
7. Board Oversight: What the board monitors quarterly

BOARD KPI DASHBOARD

You must define board-level metrics:

Financial KPIs

- AI ROI
- EBITDA impact
- productivity gains
- revenue from AI-enabled products

Operational KPIs

- forecast accuracy
- downtime reduction
- claims automation rate
- drug discovery cycle time

Organizational KPIs

- AI adoption
- reskilling completion
- employee trust

Governance KPIs

- bias incidents
- model drift
- regulatory findings
- AI-related cybersecurity events