Element AI: Operationalizing AI in the Enterprise

Alex Shee
We help enterprises operationalize AI to work smarter, together.
**LEADERSHIP**

**JF Gagné**, CEO
15 years leading disruptive decision and data science-based software companies

**Yoshua Bengio**, Co-Founder
Godfather of Deep Learning, co-author of the book on Deep Learning, full Professor at UdeM and Head of Montreal Institute for Learning Algorithms

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**COMPANY**

**Years**
Founded Oct. 25 2016

**Employees**
100+ Ph.D.s
18+ Faculty Fellows

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**ELEMENT AI SERVICES**
AI services to define what’s right for your needs

**ELEMENT AI SOLUTIONS**
AI solutions that support your financial service and supply chain needs

**ELEMENT AI ENABLEMENT**
AI models governed by a powerful toolkit

**ELEMENT AI PLATFORM**
All coordinated, improved, serviced, and monitored in production

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**WE WORK WITH**
FINANCIAL SVC & SUPPLY CHAIN CUSTOMERS

Governments, Banks, Asset Managers, Insurers, Retailers and CPGs, Manufacturers
EAI works as a partner with C-Suites to bring cutting edge DL research and algorithms directly from the lab into scalable and operationalized DL solutions.

**Fundamental Research**
Our in-house Fundamental Research Lab works on state-of-the-art breakthroughs and publishes research.

**Applied Research**
Our Applied Research Lab (ARL) applies fundamental breakthroughs to real world problems.

**Components Library (APIs)**
Our Core team leverages ARL findings to develop reusable and deployable components used for PoCs & solutions.

**PoCs & Solutions**
Our components are assembled and contextualized in industries to become PoCs Solutions.

With the close of our Series B (150M€ / total 250M€), EAI is expanding into the EU through Paris and London.
Fewer than 1 in 10 businesses are ready for AI in production

“I have more pilots than Lufthansa.”

CIO overheard at #WebSummit
Why? AI is like the new electricity 100 years ago
In the age of AI, balancing the next 1 and 100 steps is critical.
This means **continuous self-diagnosis**

**AI use case:**
a desirable, feasible, and viable application of AI capabilities to a business problem or opportunity

**AI roadmap:**
a prioritized sequence of AI use cases
Three elements of operational AI

1. Capabilities

2. Components

3. Solutions

- **EXPLAINABILITY**
- **TIME SERIES**
- **NLP**
- **OCR**
- **USER INTERFACE**

### Underwriting Partner
CAPABILITY
Auto doc processing

### Knowledge Scout
CAPABILITY
Question answering
1. Capabilities

Capture useful capabilities from AI research.

Growth of annually published papers by topic (1996-2017)
Source: AI Index Report 2018, Stanford

Research programs at Element AI
- Human-AI Interaction (Explainability)
- Adversarial Learning
- Natural Language Processing
- Representation Learning
- Meta-Learning
- Generative Modeling
- Fundamental Machine Learning
- Computer Vision
- Simulators
- Reinforcement Learning
- Robotics
AI explainability for an auto parts manufacturer

AI explainability: the capability of providing the “why” behind an AI model, both its output and its inner workings.

Develop capabilities into reusable, production-ready AI components.

Stalled AI projects by phase stalled
Source: Dimensional Research / Alegion, 2019

- Proof of concept: 33%
- Algorithm development: 13%
- Model validation and scoring: 13%
- Training data preparation: 7%
- Algorithm training: 6%
- Model deployment: 6%
- Post-deployment enhancement: 4%

Development
- Data Labeling
- Model Selection
- Training & Experimentation
- Benchmarking

Production
- Deploy
- Monitor & Control
- Improve
- Reuse
Data and infrastructure for an insurance company

**Sample Model Lifecycle Workflow**

1. **Manage Data**
   - Review the quantity, quality, relevancy, and potential biases of available data to ensure it can meet the design requirements; adapt design if not.

2. **Train Model**
   - Train different models on diverse training data sets. Develop attributes such as model accuracy metrics, learned parameters of the model and visualization statistics.

3. **Evaluate Model**
   - Test different models' accuracy and features until performance is met. Inspect details of models and compare one or more models against each other.

4. **Deploy**
   - Determine deployment requirements (e.g., latency, security, etc.) then launch by connecting the model inputs and outputs to the other systems or services.

5. **Operationalize**
   - Incorporate the model outputs into product, processes or other workflows, allowing users and experts to give feedback on the model's live predictions.

6. **Monitor & Support**
   - Monitor the accuracy and engineering performance using live measurements; calibrate data pipelines and retrain models as needed.
AI development toolkit for a large bank

ELEMENT AI TOOLKIT

Orkestrator
Workload Scheduler, Security, Access, Versioning, Storage and more

DATA CENTRE GPU, CPU, RAM, and storage on cloud or on-premises

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AI ENABLEMENT TOOLS

Data Labeller
Produce quality data efficiently with State-of-the-Art Active Learning

Experiment Framework
Run hyperparameter searches for common algorithms

Bench
Coordinate multiple solutions across teams to solve a well-defined problem
3. Solutions

Assemble specific solutions that continuously improve over time.

Functional parts of the company with AI projects
Source: O'Reilly, 2019

Dimensions of AI organizational maturity
Impact in Capital Markets

Improved portfolio rebalancing by 10bps compared to expert execution. Help traders retain returns by optimally scheduling flows for minimizing the total cost of implementation.

OFFERING

EI Trade Flow Scheduler

DEPLOYMENT MODEL
AI Software-as-a-Service (SaaS)

Impact for Insurance Underwriters

Increased savings of up to 27% by helping underwriters to streamline data intake and provide decision support across all stages of underwriting process.

OFFERING

EI Underwriting Partner

DEPLOYMENT MODEL
AI Software-as-a-Service (SaaS)

Impact for Transports & Logistics

Doubled the accuracy of predicted wait times. Help truck dispatchers visualize expected wait times and determine when their drivers should arrive to minimize idling.

OFFERING

EI Custom Development

DEPLOYMENT MODEL
On-Prem
Operationalize to **increase AI maturity**

1. Capabilities
2. Components
3. Solutions

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We help you operationalize and mature
Thank you!