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Generative AI
for Membrane Filtration Equipment
and beyond

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MontBlancAI

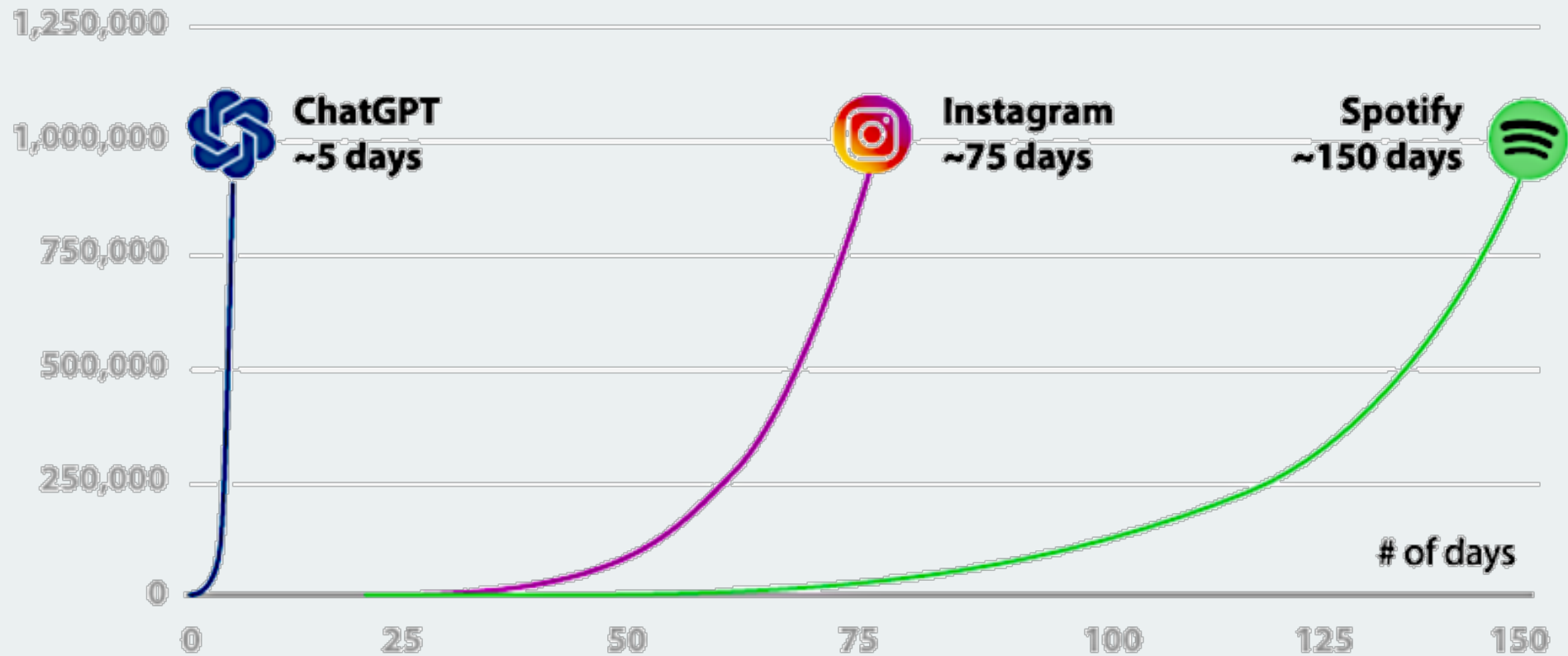# What is Generative AI?

- It is a subcategory of AI
- It can generate content

- It is NOT ONLY ChatGPT
- It will NOT replace humans

- It will EMPOWER humans to do more

- It is here to stay

ChatGPT has been the fastest growing software …

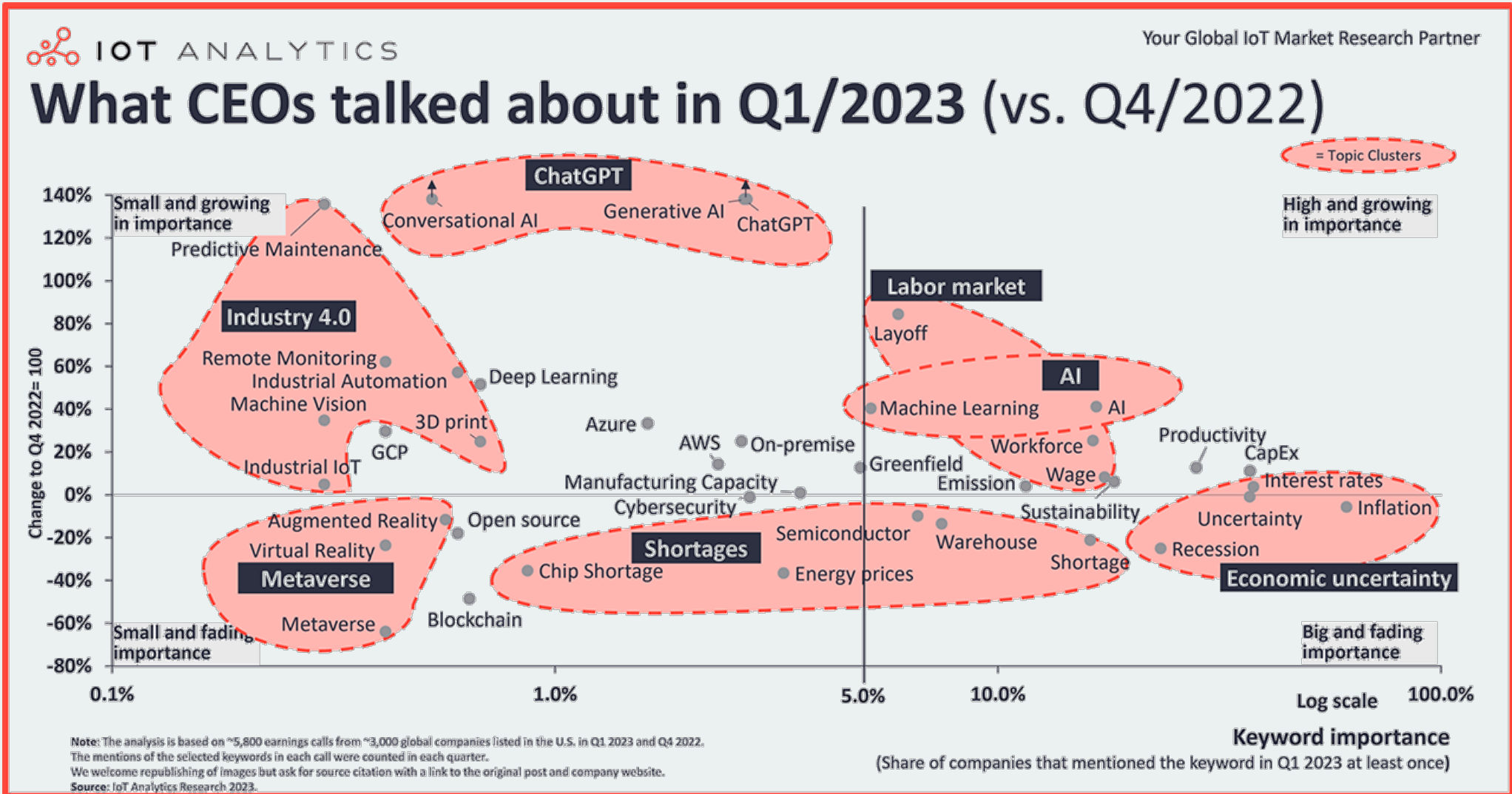**~ Path to 1 million users*** (# of days from launch)

ChatGPT
~5 days

Instagram
~75 days

Spotify
~150 days

# of days

Sources: Google, Subredditstats, Media Reports

… and CEOs are all over it …

… but how can it be useful in the industrial context?

Marriage between Generative AI and industrial data
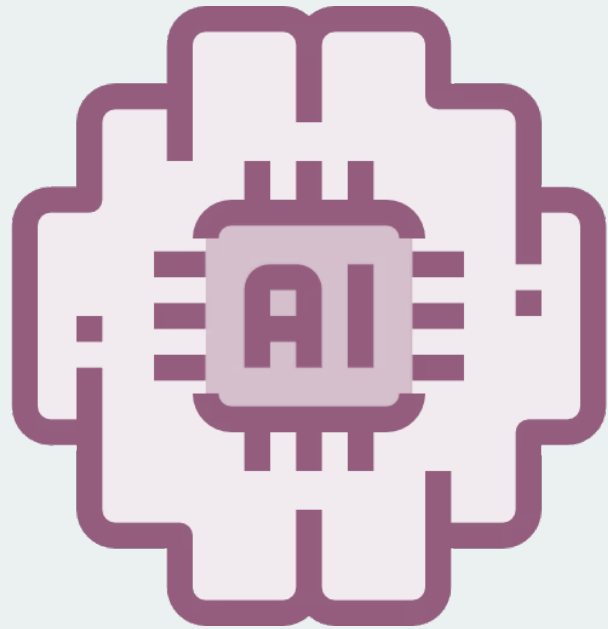
Public
Large Language Models (LLM)

Private and Sensitive
Corporate Data

Industrial Applications of Generative AI

Sales & Marketing

- Content Generation
- Product recommendations
- Chatbot and Virtual Assistants
- Ad Optimization
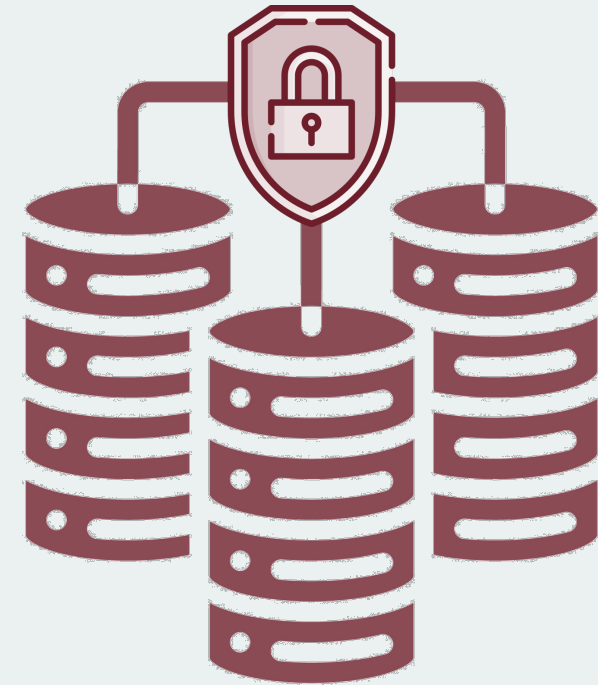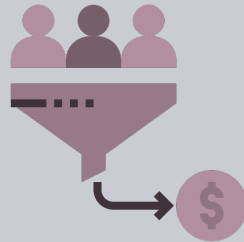- …

Product Development

- Customization and Personalization
- Collaboration and Co-creation
- Design Insights
- Rapid prototyping
- …
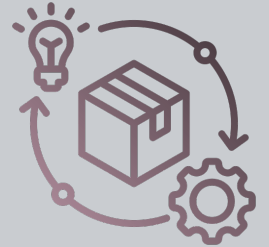
Supply Chain Optimization

- Inventory and Logistic Planning
- Demand Forecasting
- Risk mitigation
- Supplier selection
- …

Operations

- Production and process efficiency
- Process and Quality control
- Predictive maintenance
- Knowledge management
- …

Applications for Membrane Filtration Equipment

Production Monitoring

- ✓ Uptime monitoring
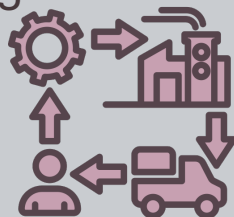- ✓ Classification of downtime
- ✓ Trend identification
- ✓ CIP process validation

Health Monitoring

- ✓ Detect early signs of failures
- ✓ Find issues before they cause downtime
- ✓ Enables traceability

Predictive Maintenance

- ✓ Keep membranes running for longer
- ✓ Keep maintenance costs in check
- ✓ Pro-active maintenance instead of reactive fire fighting

Effective Troubleshooting

- ✓ Troubleshoot faster and more effective
- ✓ Discover the root causes to avoid future failures
- ✓ Full access to historical data

Case Study

Equipment
- Dairy with more than **2 million liters milk per day**
- **MF membrane** filtration equipment: separation of casein and the whey protein; **4 loops**

Business Challenge
- Are there **resources** that can be **saved**?
- How to **continuously validate** the **CIP**?

Implementation
- Connect to the S7 PLCs and stream all **200+ data points**
- Run **AI** algorithms over **billions of data points**
- **Visualize** results, and raw & aggregated data

Outcomes
- Over **1,000 cleaning cycles** have been validated. **Confidence boost** for QA and auditors.
- Identification where **time, water, lye, and acid** can be **saved.**
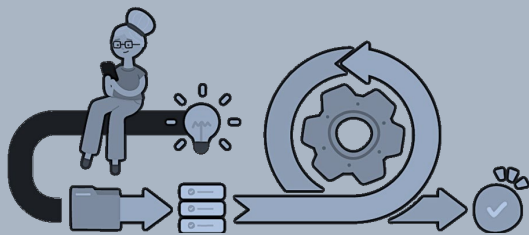- **Batch duration optimization** based on pressure

Considerations in Applying Generative AI

Generate value for the business

- Start small and iterate fast
- Often you don't know where the journey is going to take you, be agile

Acquire the knowledge

- The underlying technology is complex and changes quickly
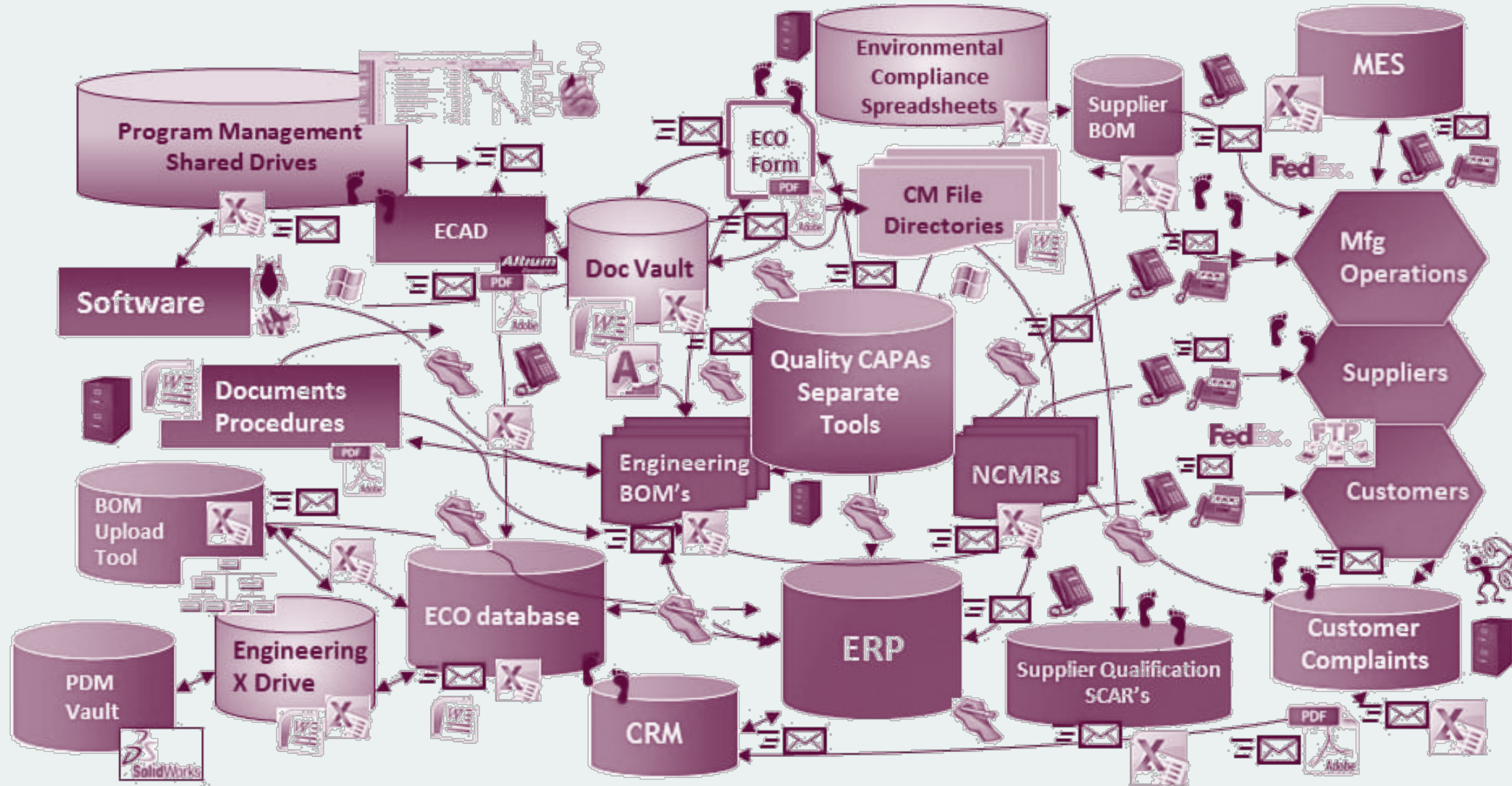- Bring in the missing knowledge through partners if needed

Security, Privacy, and Trust

- Policies: does and don'ts
- Pick the right Generative AI vendor
- Don't stop experimenting!

From silos of disconnected systems to a unified lens

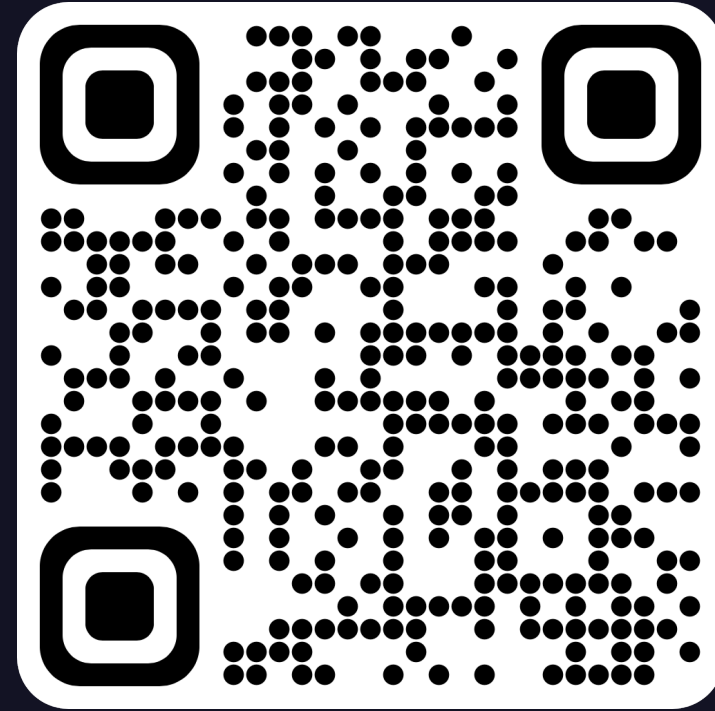# From silos of disconnected systems to a unified lens

From silos of disconnected systems to a unified lens

Questions?

Let's connect!