How Artificial Intelligence Will (and Won’t) Change Procurement and Contracting

Separating fact from fiction to understand the practical impact of AI
Agenda

- About Forrester
- About Determine
- Introducing speakers
- The state of AI: Andrew Bartels, Forrester Research
- AI practical applications: Julien Nadaud, Determine
- Q&A
A global company addressing global challenges

250+ clients around the globe

Leading Cloud platform in Source to Pay

Network of global partners

200 people at your service worldwide

Publicly traded (NASDAQ: DTRM)

Recognized by leading analysts
Andrew Bartels | VP, Principal Analyst, Forrester Research

Andrew Bartels primarily contributes to Forrester’s offerings for the CIO. As an analyst, he is a leading expert on tech market trends and sizing, cloud and smart computing technologies, tech budget benchmarks and processes, and tech’s impact on business operations. He also researches the growing customization of tech systems for industry-specific solutions for utilities, energy, government, education, and professional services sectors. He is a thought leader in buy-side technologies and business networks. Andy has been with Forrester for 15 years, starting with Giga Information Group which Forrester acquired in 2003.

Julien Nadaud | Chief Product Officer, Determine, Inc.

Julien Nadaud’s focus is to bring teams and innovative technologies together to build a global industry leader in strategic sourcing, supplier management, procure-to-pay and contract management. A global specialist in eProcurement and spend management, he has an impressive career of industry innovations, having implemented more than 100 projects worldwide.
Is Artificial Intelligence in business a myth?

Everyone talks about it

Nobody really knows how to do it

Everyone thinks everyone else is doing it

So everyone claims they are doing it

Let’s figure it out
We work with business and technology leaders to develop customer-obsessed strategies that drive growth.
What is artificial intelligence (AI)?

AI technologies mimic humans' abilities to sense, think, and act

- Sensing AI includes human recognition and machine recognition
- Acting AI includes virtual agents, natural language generation, robotic process automation, and expert system decision management
- Thinking AI includes knowledge representation, rules engines, machine learning, text analytics, natural language processing, and text analytics

How do AI technologies work?

- Connecting the components to build AI systems
  - Linking different AI components can create an AI system that can turn sensing into action
  - All AI systems need to be trained, and use iteration and feedback to get better
  - AI systems today – and probably in the future – work best as complements for humans, not as replacements

How mature are various AI technologies?

- **Different AI technologies are at different stages of maturity and potential**
  - Decision management, text analytics and natural language processing are most mature
  - Machine learning platforms and robotic process automation are becoming more mature
  - Deep learning platforms, swarm intelligence, and natural language generation are very immature

Forrester Research, Inc., "TechRadar™: Artificial Intelligence Technologies, Q1 2017"
How to evaluate AI tools

**Algorithms**

› Are they organic functions in an app, or bolt-ons
› Where do they come from
› How mature are they
› Are they designed for relevant tasks and problems
› How do they get trained

**Data Sets**

› Where do they come from (are they relevant)
› How big and tenured are they (are they robust)
› Have they been tested and improved (are they reliable)
AI and the purchasing process, and the eight ePurchasing products

1. Spend analysis
2a. Supplier assessment
2b. Supplier identification
3. Sourcing
4. Contract life-cycle management
5. Procurement
6. Order fulfillment (services procurement)
7. Electronic invoice processing and presentment
8. Supplier network services
AI and ePurchasing

Four AI technologies have the most relevance to the sourcing, procurement and contracting processes:

- Decision management to help people make better sourcing, purchasing, and contracting decisions, through the use of expert systems
- Text analytics and natural language processing to capture information from requirements documents, past RFXs, contracts, and vendor responses
- Machine learning platforms and semantic analysis to categorize and sort information from these document sources into taxonomies, metadata categories, and appropriate process steps
- Robotic process automation to handle repeated, standardized steps in the procurement, sourcing, contracting, or vendor management process
Machine learning is most common AI tool being used by ePurchasing and CLM vendors

Which artificial intelligence tools and systems are you investing in?

- Machine learning platforms: 91%
- Semantic analysis: 78%
- Text analytics and natural language processing: 74%
- Intelligent recommendation solutions: 70%
- AI-enhanced analytics solutions: 70%
- Decision management: 65%
- Robotic process automation: 52%
- Intelligent research solutions: 52%
- Virtual agents: 48%
- Natural language generation: 42%
- Deep learning platforms: 35%
- Pre-trained vertical solutions: 26%
- Speech recognition and analysis: 22%
- Other (e.g., expert system, voice translation): 13%
- Image and video analysis: 9%
- Facial recognition: 4%

N = 23 ePurchasing and CLM vendors

Forrester Research, Inc., survey of ePurchasing and CLM vendors
AI value proposition to clients centered on better decisions and productivity gains

What do you see as the primary client value proposition of your AI-enhanced solutions? (on a 1-5 scale, with 5 highest)

- Better decisions: enabling employees to increase the probability of good business outcomes and reduce the probability of bad business outcomes
  - 4.6
- Productivity: enabling employees to be more efficient in their activities
  - 4.4
- Cost-savings: automating business processes and activities to reduce head count
  - 4.0
- New offerings: enabling the client company to launch a new revenue-generating product or service
  - 2.7

N = 10 CLM vendors

Forrester Research, Inc., survey of ePurchasing and CLM vendors
AI functions will mostly be offered as enhancements to existing products

Forrester Research, Inc., survey of ePurchasing and CLM vendors

N = 23 ePurchasing and CLM vendors
## Where AI can play a role in eSourcing

<table>
<thead>
<tr>
<th>eSourcing stage</th>
<th>The role for artificial intelligence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generate RFx</td>
<td>Natural language processing and machine learning to assemble a draft of the appropriate RFx; Expert systems to advise on content of RFx</td>
</tr>
<tr>
<td>Interact with suppliers</td>
<td>Machine learning to interpret and natural language generation to answer simple queries from suppliers</td>
</tr>
<tr>
<td>Score and receive supplier responses</td>
<td>Natural language processing and machine learning to take vendor responses and match them against your selection criteria; Expert systems to rank responses</td>
</tr>
<tr>
<td>Conduct reverse auction</td>
<td>Robotic process automation to manage reverse auctions; Expert systems to determine best bids, especially for multi-vendor awards</td>
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## Where AI can play a role in contract management

<table>
<thead>
<tr>
<th>CLM stage</th>
<th>The role for artificial intelligence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract repository</td>
<td>Natural language processing and machine learning to extract and categorize metadata</td>
</tr>
<tr>
<td>Reporting and analytics</td>
<td>Analysis of actual performance against expected results</td>
</tr>
<tr>
<td>Contract creation</td>
<td>Artificial intelligence to help users choose the right contract terms and conditions for a new contract</td>
</tr>
<tr>
<td>Contract compliance</td>
<td>In addition to integration with transaction systems, workflows to facilitate completion of obligations and track current status</td>
</tr>
<tr>
<td>Contract optimization</td>
<td>Analytics to identify risks or lost value from existing contracts and identify necessary changes to contract language</td>
</tr>
</tbody>
</table>
Where AI can play a role in spend analysis

Spend analysis was AI before the AI label became popular, using a combination of rules engines and neural networks

<table>
<thead>
<tr>
<th>Spend analysis stage</th>
<th>The role for artificial intelligence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleansing, normalizing, and classifying</td>
<td>Natural language processing and machine learning to classify PO and invoice data into product categories and vendor categories</td>
</tr>
<tr>
<td>Opportunity analysis</td>
<td>Analysis of classified spend data to identify best sourcing opportunities</td>
</tr>
<tr>
<td>Compliance analysis</td>
<td>Analysis of classified spend data against contracts and by unit to identify spending that is not with contracted vendors, and the causes of this spending</td>
</tr>
</tbody>
</table>
Recommendations

• Artificial intelligence is a mixture of mature and immature technologies
  • All AI systems require training
  • Beware of hype and “AI-washing”

• AI will have a role to play in purchasing, but mostly as a complement to humans, not as a replacement for them
  • AI will make analytical-intensive ePurchasing apps like spend analysis and supplier risk and performance management easier to set up and to use
  • AI will creep into other ePurchasing apps through natural language processing, robotic process automation, and expert system decision management

• AI’s greatest contribution in ePurchasing will be for the more effective sourcing, contracting, and management of services
Putting AI to Practical Use

Where it’s working right now
Machine Learning at the core of AI use cases

- Artificial intelligence works well with large amount of data
- History brings immediate value, getting better over time
How Determine applies Artificial Intelligence

**Classification**
- Place Items into specific Categories
- Reduce human cost
- Perform classification that would be very difficult to achieve without AI

**Recommendation**
- Give users best options to choose
- Speed-up process
- Task automation
- Optimize decisions
- Share knowledge

**Prediction**
- Drive operational decisions
- Anticipate
- Make better decision
- Increase savings
- Improve visibility
- Lower risk

**Conversation**
- Interact in plain “English”
- Natural conversation (chatbots)
- Increase user adoption
- Build knowledge bases

- Categorize spend
- Tag clauses and obligations
- Contract Review
- Identify risk

- User experience
- Recommend products
- Recommend suppliers
- Recommend best contract type...

- Spend prediction
- Price prediction
- Risk prediction
- Payment delays
- Good receiving

- Support users
- Digital assistants
- Business Intelligence
- Contract analysis
Some Classification Use Cases
Spend Classification, Supplier Identification

- Match suppliers, materials, G/L accounts, etc. to classify spend on normalized supplier information

Machine Learning Classifier

Deep Learning allows
- Better classification
- Less manual work
Supplier Risk Management

PR, Lawsuits, Social Media... → NPL → Sentiment Analysis → Supplier Information → Supplier Risks

Localization

Earthquake Report @Quake_Tracker - 2h
Mag: 5.7 - Depth: 10 km - UTC 3:21 PM - Hualien, Taiwan - USGS Info

Earthquakes in the world on February 07, 2018 (M2+)
ALL today’s M 2.9+ earthquakes as reported by the major
International Seismological agencies + I Have Felt It
reader reports
earthquake-report.com
Now, therefore, it is agreed as follows:

The Parties undertake, as from signature of the present agreement, as well as for a period of five (5) years from its termination, to not divulge to third parties the Confidential Information, nor to use it or exploit it, nor to have it used or to have it exploited to other ends than those of the present agreement.
AI outpaces lawyers in reviewing legal documents, new study finds

- Five previously unseen NDAs with 153 paragraphs of technical legal language
- Looking for a list of issues in each contract
- Lawyers exhibiting 85% average accuracy rate, 94% achieved by AI software
- AI took only 26 seconds to complete the task, the lawyers an average of 92 minutes

Improve lawyer role as trusted advisor
Examples of Recommendations
Use Cases
Product Recommender

- Standard use case comes from online shops
  - Suggest products based on what other users bought together with the items
  - Before, admins had to configure catalog to link items together (I want a printer, I have associated cartridges), was rarely done, too much work
  - Now the system learns by itself; no more configuration, just time saving

1-Select Item
2-View related products
3-Update the cart
Based on the history of purchasing, the system can predict which item is likely going to be purchased
- Present a preset kit to the user, ready to be added to the cart

Recurrent purchase been detected

Could detect life-cycle of a product to be re-ordered

A printer is in current use

It consumes cartridges

System detects that we need to order new cartridges soon
Sourcing Recommendation

- Use of supplier information (activity, online catalogs, website, PR, Social networks) to understand what they do
- Analyze requirements to match potential suppliers to source for an RFP

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**RFx & SIM Management**

- **RFP Requirement Specifications**
- **Semantic Analysis**
- **Deep Learning**
- **Supplier Database**
- **Supplier Recommendation**
One example of Predictive Analytics
Pricing prescription can help saving

- Prices
- Raw Material
- Stock Exchange
- Inventory Levels
- Supplier Information
- Currency Exchanges

Internet Open Data

Big Data Artificial Intelligence

Data Collection
History (3 years)
Deep Learning
Price Prediction

Supplier Network
Supplier repository

e-procurement

Needs
Recommendations
Purchase Order
Savings
One example of Conversation
Conversational Agent

Hi Determine, I’d like to create a purchase request

I’d like to buy a Grundfos pump ref 59896775

Hi John, tell me what item you want to add

This is perfect, please send me a text when confirmed

Sure, this item is in the catalog and has been added

Do you want it to be shipped at your usual location, 900 Circle 75 Pkwy?
Conversational Agent

- Help users doing procurement
  - Query information about the current documents and processes (purchase requisition in progress, documents to approve, invoices to process...)
  - Search an item from catalog to initiate a purchase request
  - FAQ and help on the use of the platform

- How can it get smarter?
  - Automated Training and Observational Learning
  - Constantly improve performance by updating knowledge base through machine learning and analysis of all known previous conversations
  - Dynamically navigate business flows to complete end-to-end processes
Main Benefits

How AI Impacts Procurement and Contracting
### What we have learned from these use cases

<table>
<thead>
<tr>
<th>01</th>
<th>Better Accuracy</th>
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<tbody>
<tr>
<td>●</td>
<td>Consistent analysis</td>
</tr>
<tr>
<td>●</td>
<td>Cover 100% of data</td>
</tr>
<tr>
<td>●</td>
<td>Continuous improvement using massive amount of data</td>
</tr>
<tr>
<td>●</td>
<td>Very detailed results</td>
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<thead>
<tr>
<th>02</th>
<th>Faster</th>
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<tbody>
<tr>
<td>●</td>
<td>Data ingestion part of the platform</td>
</tr>
<tr>
<td>●</td>
<td>“Real-time” processing</td>
</tr>
<tr>
<td>●</td>
<td>Can feed Robotic Process Automation</td>
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<thead>
<tr>
<th>03</th>
<th>Augment Human Capabilities</th>
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<tbody>
<tr>
<td>●</td>
<td>Empower business users</td>
</tr>
<tr>
<td>●</td>
<td>Assist occasional users</td>
</tr>
<tr>
<td>●</td>
<td>Learn/Share expertise</td>
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<tr>
<th>04</th>
<th>New savings</th>
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<tbody>
<tr>
<td>●</td>
<td>Can process years of data</td>
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<tr>
<td>●</td>
<td>Predictive models</td>
</tr>
<tr>
<td>●</td>
<td>Optimizations and recommendations</td>
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