



How to transform customs operations in the digital age

Decision Intelligence on Microsoft Azure

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Introduction: Facing Challenges in the Digital Age

In an era where global trade complexities are escalating, customs agencies face unprecedented challenges. Balancing the dual mandate of facilitating seamless trade and safeguarding national borders has never been more demanding. The power of Decision Intelligence (DI), brought to life through the synergistic partnership of Quantexa and Microsoft, is pivotal.

Our groundbreaking solution represents a paradigm shift in how customs operations can be conducted in the digital age. By harnessing the robust capabilities of Quantexa's DI platform, integrated seamlessly with Microsoft Azure's advanced cloud technology, we offer an unparalleled approach to data analysis, risk assessment, and operational efficiency.

This white paper illuminates the path forward for customs agencies by detailing how Decision Intelligence, rooted in cutting-edge analytics and machine learning, transforms data into actionable insights, leading to more informed decision-making. This transformation is not just about adopting new technology; it's about reimagining customs operations that are agile, secure, and future-ready.

The combined expertise of Quantexa and Microsoft is redefining the landscape of customs operations by setting a new standard for efficiency, security, and compliance in an increasingly digital world.

What's at Stake?

There is much at stake. Consider these imperatives:



Prevention of Illegal Trade

A critical objective is to prevent illegal substances, unsafe products, and arms from reaching the domestic market. Utilizing advanced AI and data analysis capabilities enhances the ability to detect and intercept such items, ensuring the safety and security of the national market.



Protection of Tax Revenue

Another key aspect is safeguarding against the loss of tax revenue. By integrating sophisticated AI tools, customs agencies can more effectively identify and address tax evasion and underreporting, thereby securing essential revenue streams vital for national economic stability.



Data Privacy, Security and Trust

Customs agencies handle sensitive data, necessitating a focus on data privacy and security in adopting innovative technologies. Equally important is the trust in these technologies, ensuring they provide accurate, reliable, and explainable outcomes without biases.



Legal, Ethical, and Technical

Addressing legal and ethical concerns, including surveillance, individual rights, and public perception, is crucial in operationalizing AI. Additionally, the implementation of AI systems demands significant technical expertise, infrastructure, and resources, making the feasibility and cost vital factors in integrating AI within existing processes and systems.

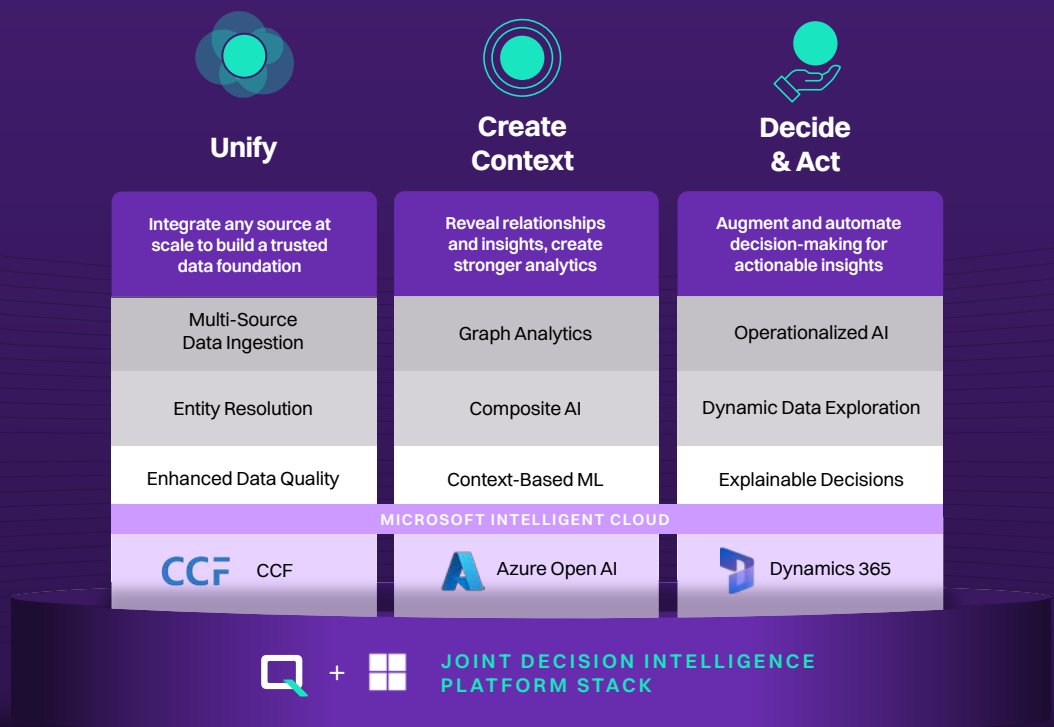
Disparate systems hamper efficiency and efficacy. A fragmented infrastructure further complicates the implementation of intricate security models. Poor data quality poses significant challenges in linking shipment data to the corresponding economic operator and connecting those operators to other vital data sources.

Consider the alternative: Decision Intelligence Three Core Pillars

There is an alternative to operating in an environment of disparate systems. Quantexa's DI platform connects internal and external data sources for a single view. DI exposes hidden risks, improves investigations, enhances compliance, and facilitates the movement of legitimate goods internationally. The platform is built on three core pillars that enable more accurate decisions to be made within the global trade environment.

Quantexa and Microsoft:

An open and modular enterprise platform for outcome-driven solutions



Accurate

- 99% matching accuracy for single views
- 20% proven de-duplication of records
- Over 75% reduction in false positive alerts

Fast

- Accelerate deployment & time to value with low-code, schema free data ingestion
- Scale up to 60 billion records in a single day
- Reduce analysis time from weeks to hours

Open

- Easy-to-integrate into your existing tech stack
- Flexible, modular platform easily configured into your operations
- Extensible with multiple views & use cases

Secure

- Advanced permissioning and role-based data access
- White-box Machine Learning models
- Transparent scoring and alerts

Decision Intelligence to Facilitate the Movement of Goods

As defined by Gartner¹, Decision Intelligence improves decision-making by understanding and engineering how decisions are made, and how outcomes are evaluated, managed, and improved by feedback.

Using artificial intelligence, Decision Intelligence unlocks the power of entity resolution and graph analytics to turn data into accurate decisions at scale.

This means that data becomes more than the sum of its parts - not piecemeal, siloed, and afflicted with poor quality. Decision Intelligence connects all data from previously siloed and scattered points and creates a single trusted, and reusable resource.

Quantexa and Microsoft help customs agencies automate their decision-making process and use DI to run operations more efficiently.



Unify | Integrate any source at scale to build a trusted data foundation

Multi-source Data Ingestion

Accelerate data on boarding with low-code, scalable, high performance data preparation and ingestion.

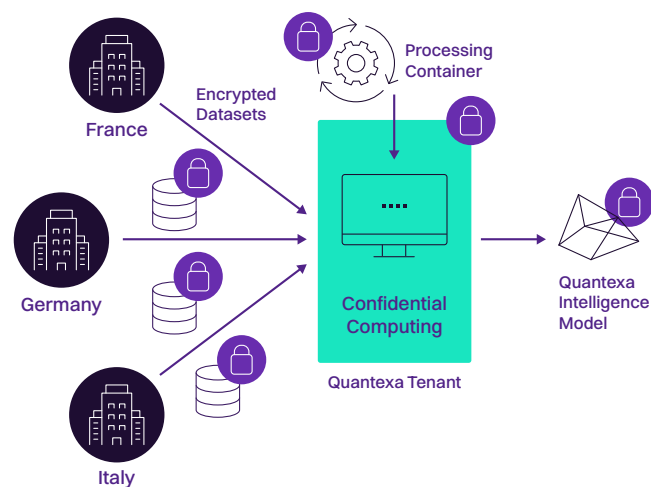
- ✓ All internal and external data
- ✓ Ingest structured and unstructured sources
- ✓ Flexible with no specific data model or schema

Data privacy compliant data sharing and data collaboration

Increase effectiveness in collaboration with other custom authorities and ports while at the same time following existing data privacy regulations.

- ✓ Trusted Execution Environments (TEE) for sensitive data processing
- ✓ Provisioning access to specific data with query access to the aggregate intelligence model
- ✓ Precise levels of control

Data sharing and data collaboration with confidential computing



¹ <https://www.gartner.com/en/information-technology/glossary/decision-intelligence>

Enhanced Data Quality

Improve data quality as part of the unification process.

- ✓ Improve data quality through relevant attributes and context from internal and external data
- ✓ Mitigate source data quality issues
- ✓ Key enabler for AI success
- ✓ End-to-end data processing at scale

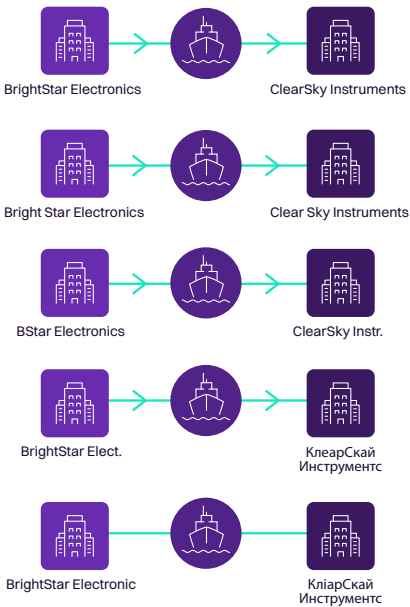
Entity Resolution

Connect disparate and ambiguous data at scale with unprecedented accuracy to create complete views of shipments, containers, economical operators, people, organizations, places, and other data.

- ✓ Proven up to 99% match accuracy
- ✓ Multiple views for multiple use cases on a single deployment - without data duplication
- ✓ Advanced data permissions and security protocols

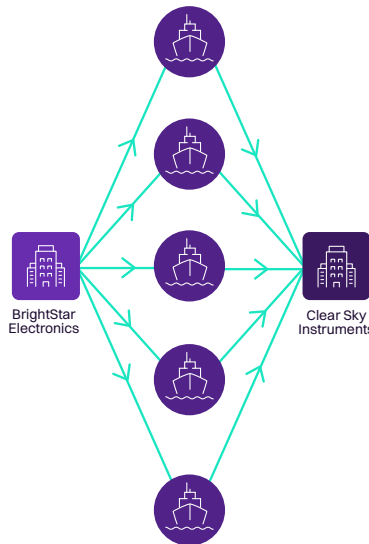
Entity Resolution in action for customs agencies

Without Entity Resolution



Fragmented view of shipments, trader profiles not built accurately

With Entity Resolution



Traders resolved and linked

Network Representation



Relationships show aggregated data between traders



Graph Analytics

Reflect real world relationships to reveal the context of shipments, containers, economical operators, people, places, organizations and other entities interact linked with each other.

- ✓ Scalable Network Generation finds the most relevant connections in the latest data for any business problem
- ✓ Dynamic graphs support immediate decisions in real-time
- ✓ Flexibility to make graphs relevant for different use cases across your enterprise

Composite AI

Improve AI's versatility and efficiency in decision-making models by combining different techniques.

- ✓ Complement both traditional and emerging methods with domain knowledge and human expertise
- ✓ Maximize the value of business expertise, particularly when there are few known outcomes
- ✓ Extend the applicability of AI and its value by solving high complexity problems previously deemed infeasible

Context-Based ML

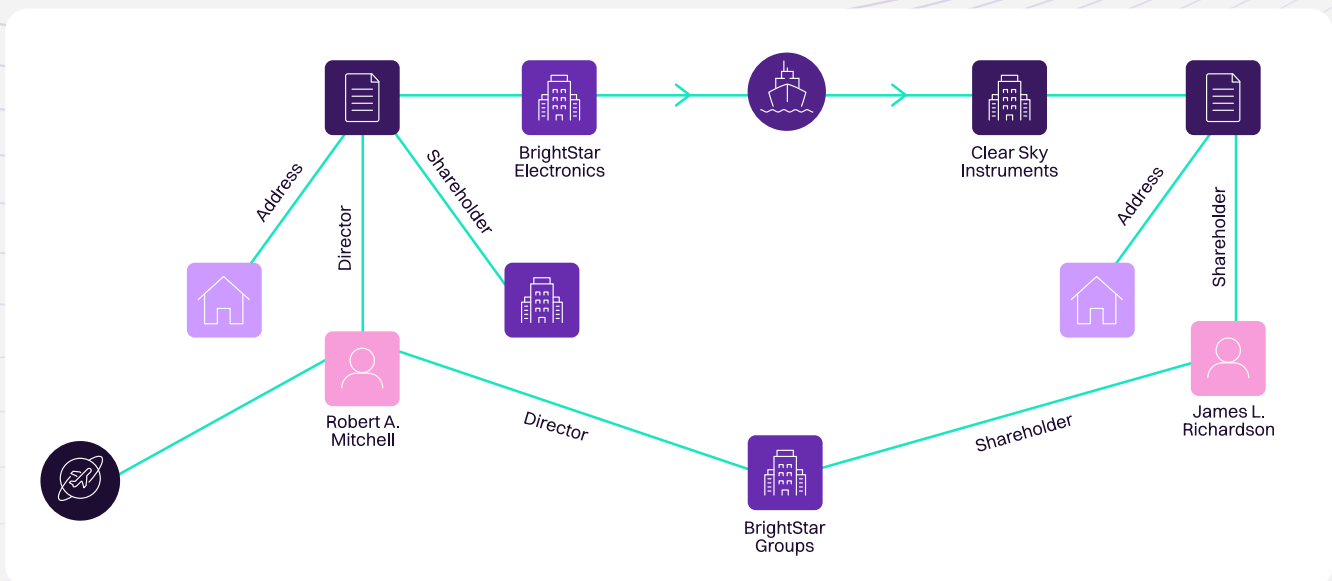
Build stronger predictive models by using contextual enrichment to help you build better features.

- ✓ Deliver greater model uplift than improved machine learning algorithms alone
- ✓ Single views and graph views as input into the model
- ✓ Support multiple different networks without data duplication

Summarization and Conversational AI

Accelerate context creation with Large Language Models and Azure OpenAI.

- ✓ Provide higher user experience when working with the Quantexa DI Platform
- ✓ Improve productivity in analytics and information gathering
- ✓ Ingest and analyze unstructured data
- ✓ Process huge workloads and maintain overview on many data points





Operational AI

Seamlessly deploy AI models into real-time production environments with the right data and context.

- ✓ Support many use cases with one set of data
- ✓ Reduce cost, risk and time-to-value of AI programs
- ✓ Deploy highly scalable AI solutions with granular security and data privacy consent

Dynamic Data Exploration

Empower teams to search for and visualize data in rich detail, including relevant relationships, transactions, and behaviors.

- ✓ Explore large volumes of data and easily identify significant information and patterns
- ✓ Faster heterogeneous data analysis
- ✓ See a holistic view of data in context
- ✓ Build and train ML and AI models

Explainable Decisions

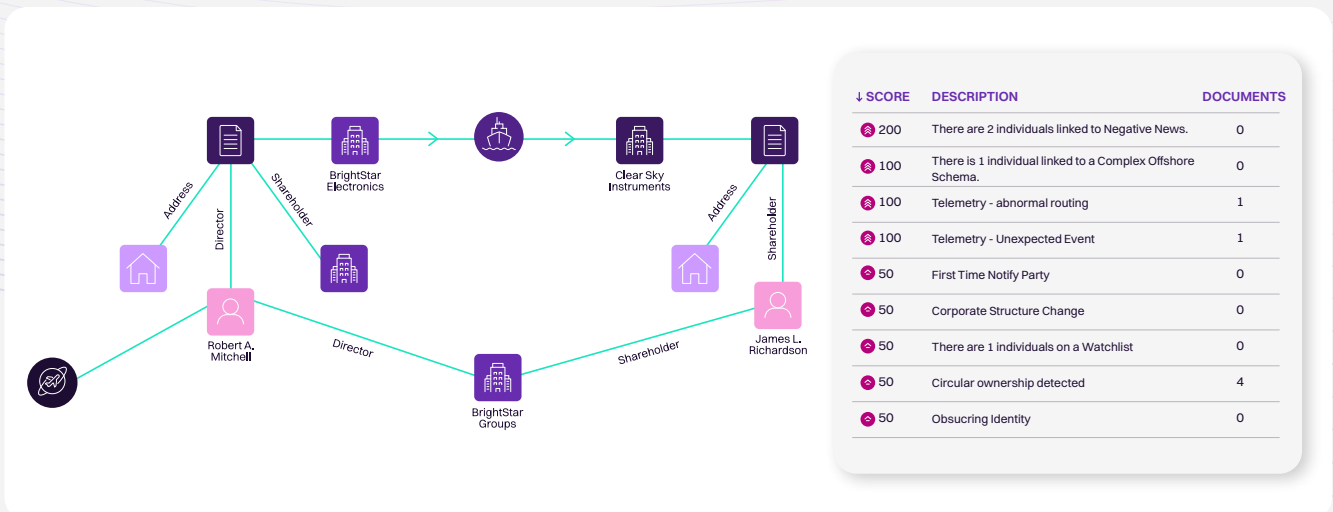
Increase confidence in analytics and automated decisions with open and transparent models.

- ✓ Understand the context created, explain results and validate models
- ✓ Test and improve models with full visibility
- ✓ Audit tracking to comply with regulatory and customer requirements
- ✓ Take confident action based on contextual analysis

Take actions

Handle and process insights from risk management with Microsoft Dynamics365 case management.

- ✓ Manage and process cases from internal and external sources to different departments and frontline workers in customs and port operations
- ✓ Track the process from the initial intake of a finding, through the remediation process, to the final resolution
- ✓ Monitor effectiveness of risk-management, operating costs, compliance issues and efficiencies



By unifying intelligence across all channels and threats, far greater context can be realized to include high quality alerts and efficient investigation cycles. Quantexa's DI Platform advances policy and decision-making, re-imagines customer service delivery, enforces compliance, and identifies previously hidden risks.

Bottom line: Quantexa's DI Platform delivers deeper insights, improves operational efficiency, and drives down costs.

Decision Intelligence is proven to run agencies more efficiently, improve trust and foster transparency

180%

Uplift in fraud detection

\$1bn

Additional revenue per year

3 weeks → 5 min

Reduction of pre-investigation

94%

Reduction of traders

500 million

Real time analyzing

99%

Matching accuracy

Decision Intelligence in Action: Accuracy, Compliance, Security

DI is tailored to address the multiple use cases encountered by customs agencies. As shown in the following examples, DI enhances accuracy, compliance, and security in multiple customs operations:



Under or Overvaluation of Goods

In customs operations, inaccuracies in the declaration of a shipment's value can arise, either intentionally to evade the correct tariffs or unintentionally. DI aids by cross-referencing declared values with global market values, past declaration histories, and associated transactional data. Predictive models within DI can automatically detect and highlight discrepancies, prompting closer scrutiny on declarations that deviate from expected value ranges.



Misdeclaration

Goods can be inaccurately described, classified, or both, leading to incorrect duty payments or even allowing restricted or prohibited items to pass through. Using DI, customs agencies can analyze historical data, correlate product descriptions with appropriate Harmonized System (HS) codes, and reference shipment origins and destinations. This analytical approach ensures that potential misdeclarations are proactively identified and flagged for more in-depth inspection.



Dual Use

Some goods have both civilian and military applications, posing a unique challenge as they can be harmless, in one context, and dangerous in another. With DI's capabilities, customs operators scrutinize shipments for patterns, origins, destinations, or known entities associated with dual-use goods procurement. By creating comprehensive entity profiles and cross-referencing them with international dual-use goods lists, DI becomes essential in preemptively identifying shipments that may be carrying such items and by ensuring no critical IP is leaked via adversarial capital investments.



Sanction Circumventions

Navigating the turbulent world of modern geopolitics, customs agencies are increasingly confronting sanction circumventions. DI's solution addresses this challenge head-on by synthesizing unstructured and structured data sources, such as satellite imagery and Automatic Identification System (AIS) maritime data. This integration provides a comprehensive view of maritime activities, unearthing anomalies and patterns indicative of sanction-dodging maneuvers at sea. By applying DI's advanced analytics to these data amalgamations, customs agencies can better detect, and intercept attempts to undermine sanctions, ensuring compliance with current international mandates and contributing to global stability.



Terrorism

The movement of goods, funds, or individuals linked to terrorist activities poses a pressing concern for customs agencies. DI enhances security measures by integrating with watch lists, monitoring transactional flows, and analyzing shipment routes that might be associated with known terrorist regions. The advanced network analysis within DI allows for the detection of hidden relationships or patterns that might indicate terrorist activities, leading to timely interventions.



Microsoft Azure

Decision Intelligence: A trusted platform to transform your customs operations

The partnership between Quantexa and Microsoft Azure is a technological advancement and a strategic enabler for customs agencies worldwide. Our Decision Intelligence platform offers a solution to current challenges and a gateway to future innovation in customs operations. Our approach transcends traditional data analysis, providing a comprehensive, 360-degree view of operations, risks, and opportunities. By leveraging the combined strengths of Quantexa's cutting-edge analytics and the scalable, secure environment of Microsoft Azure, customs agencies can confidently navigate the complexities of modern trade while ensuring compliance and security.

As the landscape of global trade evolves, Decision Intelligence makes it possible for customs agencies and stakeholders to experience firsthand how our solution strengthens their operations to become more efficient, transparent, and resilient. Contact us for a detailed demonstration to discuss how we can tailor our solution to meet your unique challenges and objectives. **Let's redefine the future of customs operations together.**

Learn more about Quantexa's Decision Intelligence Platform and speak to an expert.

Reach out