

# EMPOWERING DATA-DRIVEN DECISION MAKING

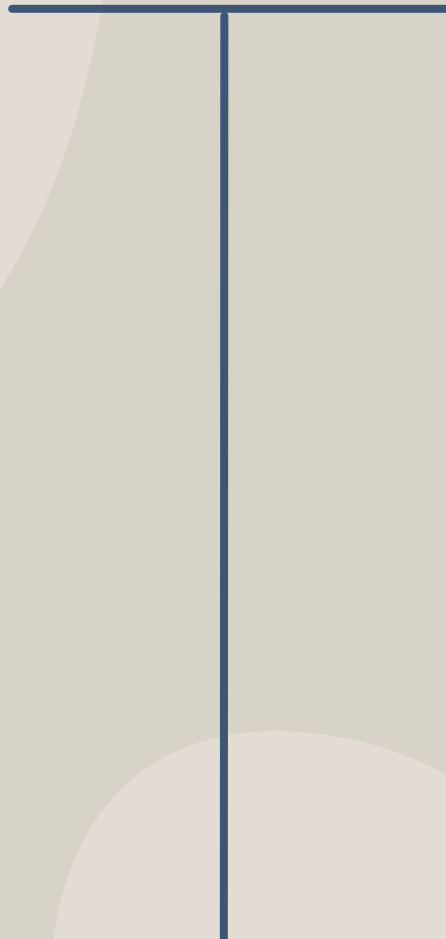
- HARNESSING THE CLOUD WITH DYNAMIC DATA MODELS  
AND EVENT-DRIVEN ARCHITECTURE

BY JEPPE GRAMON  
CTO, TRUSTWORKS



In an era where data is the new currency, Data-Driven Decision Making (DDDM) has emerged as a vital strategic tool.

Data-Driven Decision Making (DDDM) is the process of making organizational decisions based on actual data rather than intuition or observation alone."



# INTRODUCTION

## STEPPING INTO THE DATA-DRIVEN FUTURE

WRITTEN BY

**JEPPE CRAMON**  
CTO, TRUSTWORKS

---

Successful organizations today don't just store data; they actively derive insights from it to inform every business move.

Imagine a CEO deciding to launch a new product line after analyzing sales data indicating an unmet market need, or a marketing team adjusting their strategies based on customer behavior and engagement data. With accurate data at hand, companies can make decisions that are more informed, strategic, and aligned with actual market needs. As we integrate more advanced technologies into our operations, the symbiotic relationship between cloud platforms, event-based designs, and DDDM becomes increasingly crucial, revolutionizing the way businesses understand and interact with their data.

# UNDERSTANDING THE LIMITATIONS

## THE STATIC DATA MODEL CONUNDRUM

Traditional IT systems often revolve around static data models, predominantly stored in relational databases. Think of these as "snapshots" of data, capturing entities like Orders, Products, and Invoices. These snapshots offer a fixed view, providing a glimpse of "what" the data is at a particular moment but lacking the richer context of "how" or "why" the data arrived at that state. This lack of historical depth and understanding of data changes reduces the potential value of this data for decision-making and AI training.

In a world that demands agile responses, this static approach can leave businesses reactive rather than proactive, often missing out on nuanced insights.

# EVENT SOURCING

## PIVOTING TO DYNAMIC NARRATIVES

---

What if, instead of focusing on the current state of data, we concentrate on its evolution? This shift leads us to an event-driven dynamic data model where events capture changes in data along with the intentions behind those changes. Instead of merely recording the end state of a data entity, event sourcing focuses on logging all changes (events) that affect the data.

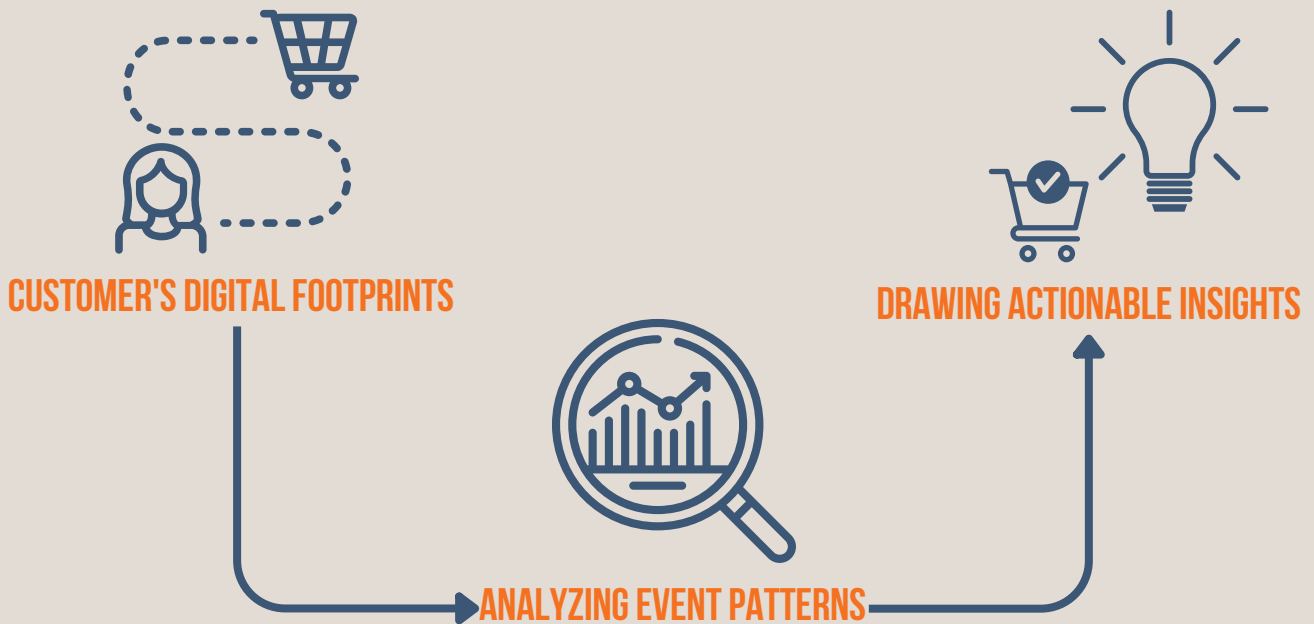
These events capture not just what changed but also offer clues about why a particular change happened, preserving business intent. For instance, within an order management system, rather than storing a singular "Order" entity, the system tracks events such as Order-Created, Product-Added-To-Order and Order-Accepted. This approach provides a comprehensive audit trail, vital for traceability and ensuring data integrity.



# KEY BENEFITS OF EVENT-DRIVEN DYNAMIC DATA MODELS

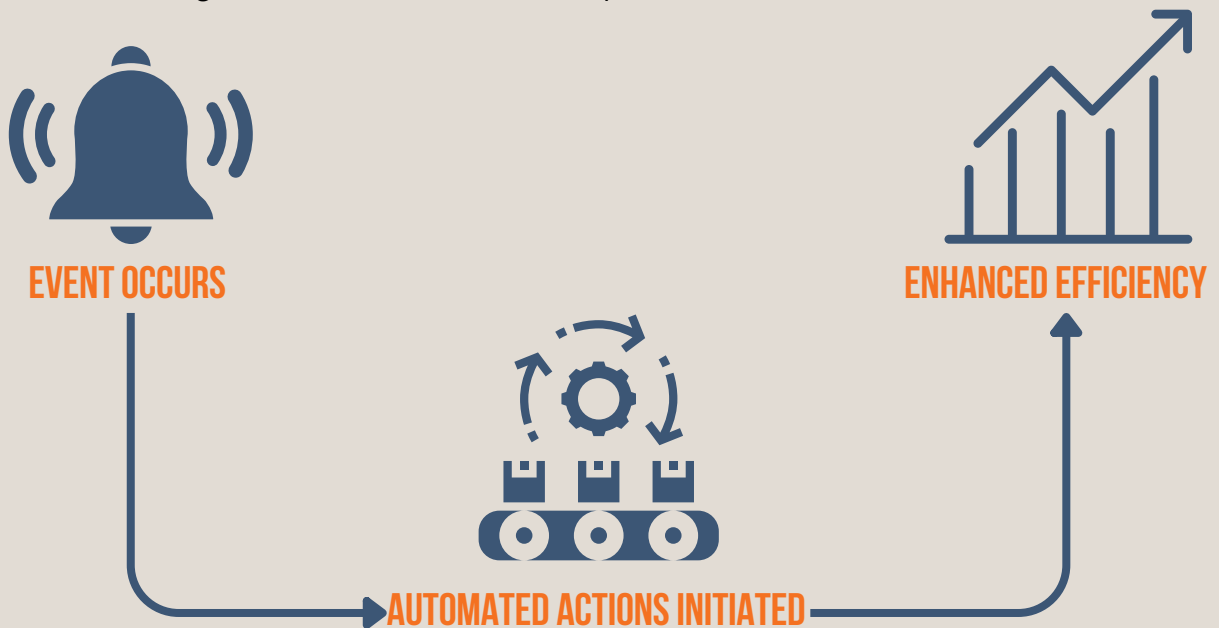
## 01 BUSINESS INTELLIGENCE (BI)

Events open up a new dimension for BI. By analyzing event patterns, businesses can draw actionable insights, such as understanding a customer's journey from adding a product to their cart to eventually making a purchase.



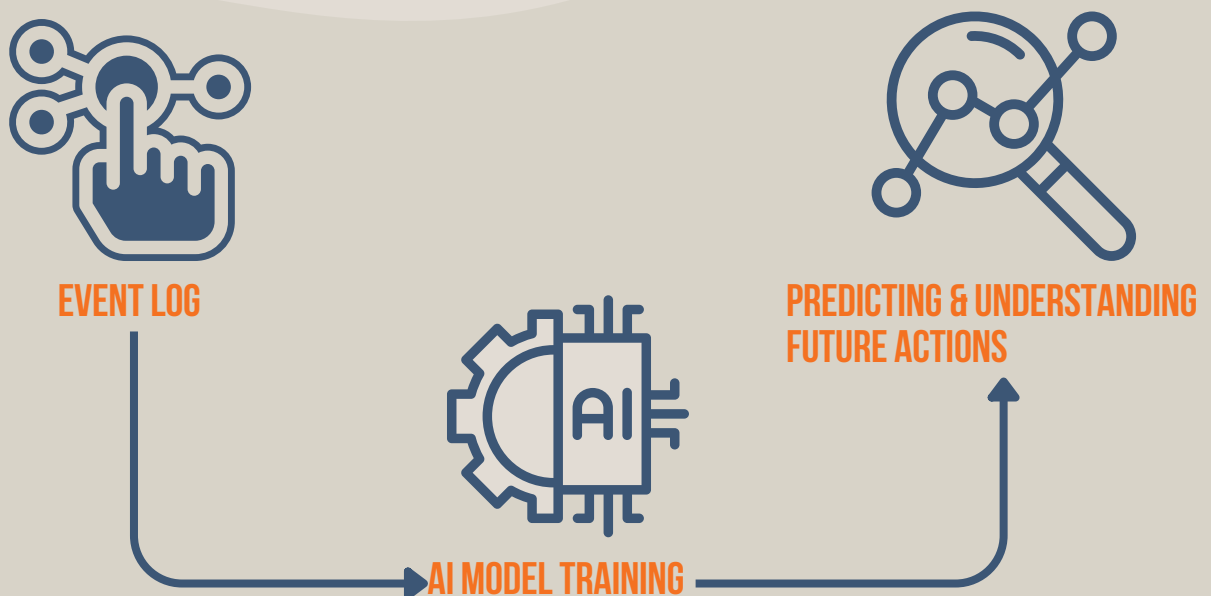
## 02 PROCESS AUTOMATION

Event-driven systems naturally cater to business process automation. A sequence of events can trigger specific automated actions, leading to smoother and more efficient operations.



## 03 ENHANCED AI LEARNING

Event logs can serve as a gold mine for AI training. Machine Learning models can be trained on these logs, enabling them to predict future trends, understand user behaviors, and even automate complex decision-making processes. Events offer a sequential understanding of data changes, which is invaluable for time series analysis and predictive modeling.



# ADAPTIVE EVOLUTION WITH EVENT: FLEXIBILITY IN ACTION

The inherent flexibility of event-driven systems allows businesses to easily introduce new events or modify existing ones. Consider a practical scenario: An Order Management system, initially designed without the capability to recognize referral traffic, needs to adapt to an environment where referral marketing is driving significant business.

Two distinct solutions emerge from this challenge:

01



## MODIFY EXISTING EVENTS

The first approach is to enhance the existing Order-Created event. By simply introducing an optional “ReferralCode” field or property, the system can now capture referral data without drastically altering its existing structure.

02



## INTRODUCE NEW EVENTS

An alternative—and more explicit—approach is the creation of a dedicated event to capture this new business dynamic. An event like Order-Created-Based-On-A-Referral can be introduced. Not only does this event capture the ReferralCode, but its very name also offers an immediate understanding of its significance, indicating that the Order was uniquely created as a result of a referral.

With an event based design, such adaptive evolution isn't a drawn-out, resource-intensive process. Instead, it's a matter of strategic design choices, quick configurations, and roll-outs—ensuring that businesses can swiftly respond to changing market dynamics and internal strategies.

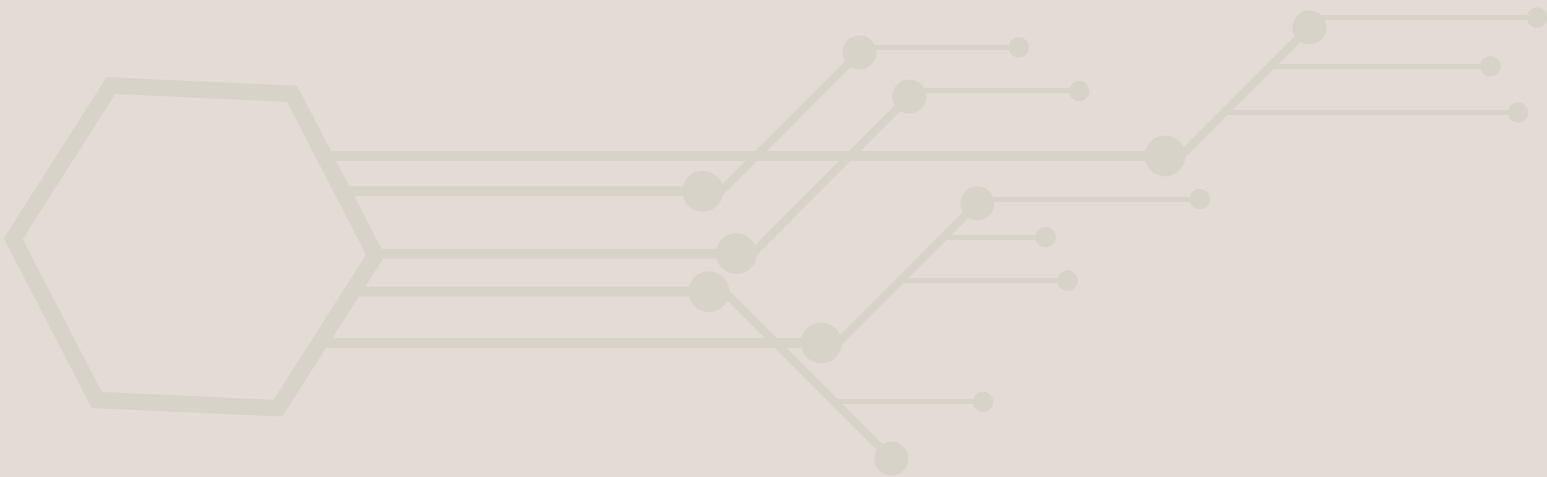
This example illustrates the malleability and responsiveness that event-driven systems bring to the table, allowing businesses to remain agile in a fast-paced world.



# A GLIMPSE INTO THE FUTURE

---

Imagine a future where AI, trained on a sequence of events, can predict when a customer is most likely to make a purchase, or which products they're likely to buy based on past behaviors and broader market trends. Such a level of precision is only possible when we shift from static to dynamic, event-driven data models.



# THE CLOUD-POWERED SHIFT TO EVENT-DRIVEN DYNAMICS

## MERGING EVENT SOURCING WITH CLOUD ARCHITECTURES AMPLIFIES THE BENEFITS MANIFOLD:



### UNPARALLELED SCALABILITY

Cloud platforms like AWS Aurora, AWS DynamoDB, EventStoreDB, AWS Document DB, Axon Cloud, Cassandra, or Azure Cosmos DB can handle a plethora of events, adjusting in real-time to the influx, ensuring high performance.



### AI AND PREDICTIVE ANALYTICS

Event logs provide a detailed and precise input to AI training. Cloud platforms, using tools like Amazon SageMaker or Azure ML, can derive predictive models from these logs, forecasting future patterns and enhancing decision-making processes



### OPERATIONAL STREAMLINING AND AUTOMATION

By intertwining event-driven models with cloud services, business process automation becomes more intuitive. Specific sequences of events can activate cloud functions or workflows optimizing operations, through cloud technologies such as AWS Stepfunctions or Azure Logic Apps.



### SEAMLESS INTEGRATIONS AND EVENT-DRIVEN ARCHITECTURE

Beyond event sourcing, an event-driven architecture (EDA) ensures systems respond in real-time to events. This can be a custom action, system behavior, or external trigger. Events can be published using AWS EventBridge, Kafka, Cloud Pub/Sub, or Azure Event Grid. EDA facilitates the design of systems where components or services produce or consume events. For example, a Product-Added-To-Order event might automatically activate inventory checks via AWS Lambda or trigger a customer notification via Azure Functions.



### RICH BUSINESS INTELLIGENCE

With event logs, cloud-powered analytics tools like Google Data Studio or AWS QuickSight can offer deeper insights into data trajectories and patterns, empowering businesses to make informed decisions.

# CONCLUSION

The fusion of event-driven architecture, robust cloud capabilities, and the principle of event sourcing offers a powerful trifecta for modern businesses. It's a path towards deeper insights, increased efficiency, and a responsive, data-driven future. In this evolving landscape, businesses aren't just keeping pace; they're setting the pace, leading with innovation and insight.

---

BY JEPPE GRAMON  
CTO, TRUSTWORKS

Trustworks is a business-driven IT transformation partner that delivers results in large and demanding digital initiatives.

At Trustworks, we have extensive experience in providing strategic development and digitization in the financial sector, green transition, public architecture, and pharma.

We are an end-to-end partner from ideation to transformation and implementation, and our specialties include IT architecture, business analysis, project management, application modernization, integrations, and system development.