ARRIA

**Impact key decision-making
by dramatically improving
time to insights**

THE POWER *of* LANGUAGE

THE POWER *of* LANGUAGE

ARRIA

ABOUT US

Arria NLG is the recognized global leader in the field of Natural Language Generation (NLG), a form of artificial intelligence specializing in extracting insights from complex data sources and communicating that information in natural language (i.e., as if written or spoken by a human subject matter expert).

Arria NLG Studio is the world's first true NLG design tool that gives users (from novice to expert) the ability to automatically generate, from complex data sources, superbly written, natural-language reports. Arria makes the best of Arria's technology available in one robust, easy-to-use tool—without relying on developers or third parties.

This simple, web-based platform empowers writers and subject matter experts to instantly create an unlimited number of sophisticated narratives based on their structured data sets.

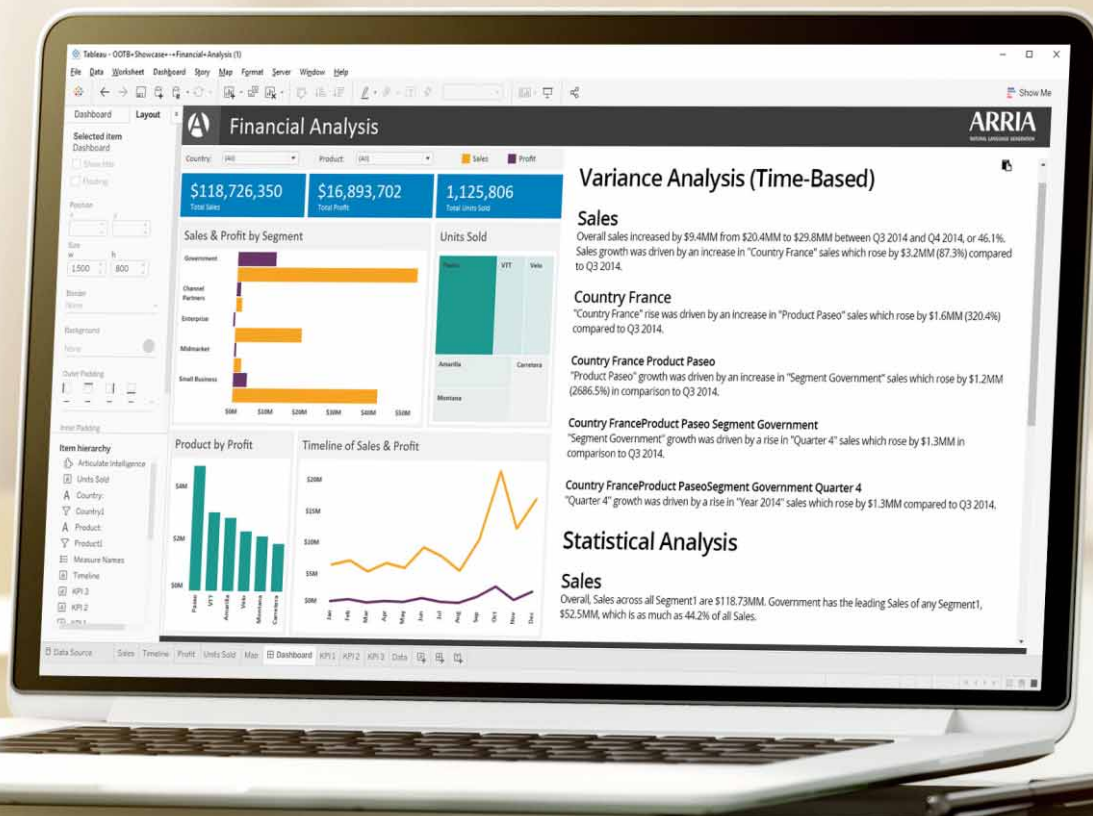"Arria is a Leader with robust writing automation and analytics..."
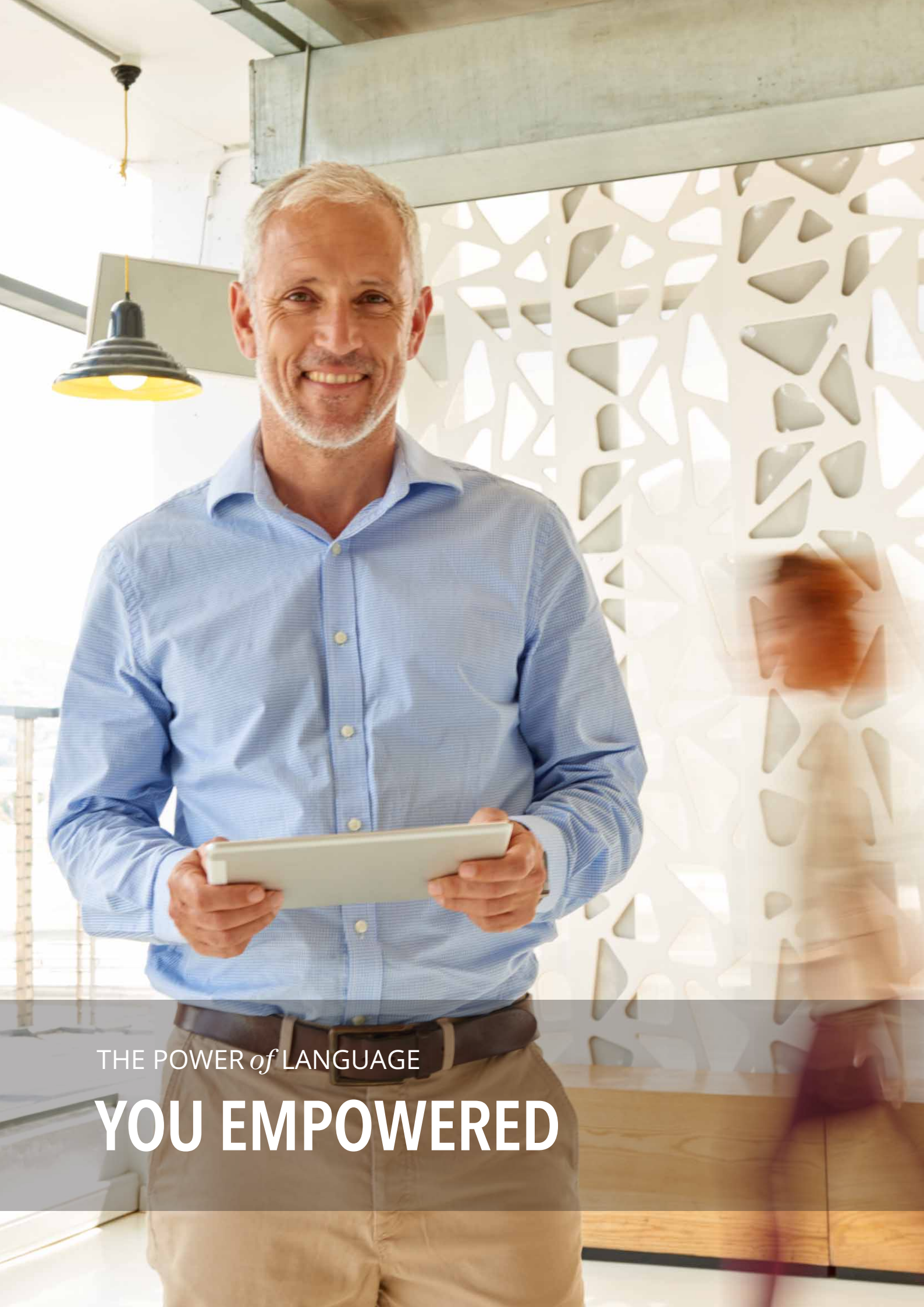
–Forrester

Read more on page 33

"Arria is a world leader in NLG, with 23 core NLG patents.
Its Arria NLG Studio product is an enterprise-level, self-service
NLG design tool with advanced analytics and linguistic
functions that enables users to easily create, edit and publish
NLG narratives. Arria solutions are deployed globally."

–Gartner
Market Guide for Natural Language Generation Platforms – 2019

THE POWER *of* LANGUAGE

YOU EMPOWERED

ARRIA

THE ARRIA DIFFERENCE

1. Arria NLG Studio—#1 Platform
Simple to use, yet sophisticated in power—the Arria platform gives you the ability to take advantage of pre-built out-of-the-box projects or you can create and customize your own projects. *See page 11*

2. Combined Technology Power
Arria is the only solution to combine advanced analytics and advanced linguistics within one tool. This gives you the ability to generate true data-driven narratives. *See page 13*

3. Deployment Options
Keeping data in one place and under your control is key to supporting best-practice data security. Therefore, Arria offers three deployment options: on premises, private cloud or public cloud. *See page 15*

4. Flexible Architecture
Arria's flexible RESTful API architecture allows seamless integration with a variety of systems that use various data formats. Call Arria services from any system without installing additional software, with any data format (via conversion to JSON). *See page 17*

5. Advanced Integrations
Arria easily integrates with all major business intelligence (BI) dashboards, Robotic Process Automation (RPA) systems, virtual assistants and chatbots —it's the only BI integration that has the ability to narrate your dashboard's entire underlying dataset. *See page 19*

6. Unparalleled NLG Expertise
Arria has a high concentration of NLG expertise (and 25 NLG patents) supported by founding NLG scientists who are globally recognized as industry leaders. *See page 23*

7. Raving Fan Client Support
Your success is our success! Arria has put great effort into developing its best-practice methodologies along with a library of online training to help bring you and your team up to speed quickly. And, of course, we're always here to help! *See page 25*

8. Flexible Pricing
Why pay for more than you need? Arria's consumption-based pricing gives you the ability to scale as needed to align with your budget and usage. *See page 27*

HOW IT WORKS

Thinks Like Einstein. Writes Like Shakespeare.
Works at *Machine Speed* to Empower YOU.

Arria NLG Studio gives you the power to transform your data into insightful, meaningful, natural-language stories and reports. For the first time, the value contained within mountains of data can be communicated in written (or spoken) language everyone can understand.

BEFORE: VISUALS ONLY

All of your data is displayed in the form of charts, graphs, and other visuals. But, **you still have to interpret what it all means**—which takes time and is often inconsistent and/or incomplete. **Dashboards with visuals alone do not tell you the full story, or give you the full picture.**

AFTER: VISUALS + NARRATIVE

With Arria, **descriptive narratives accompany your visuals** in the form of an Overview (what happened), Key Drivers and Offsets (why it happened), and Data Commentary (what potential actions should be taken)—**based on the entire dataset.**

KEY BENEFITS

Accelerate time to information for better informed decision-making across the organization.

Report on <u>all</u> data—beyond visuals alone. If it's in your dataset, you can bring insights and expertly written narratives into your report.

Ensure critical facts and insights that otherwise would be missed are now shown.

Tell a fully contextualized story, in natural language, going well beyond visualizations alone.

Customize narratives as needed in your own words, based on your own business rules.

Enjoy the full flexibility of having your data "tell you everything" in an overall story, or just the important stuff in a high-level summary.

Create on-demand, consistent, data-driven stories for improved data literacy. Keep your entire organization informed at all times.

Export your NLG augmented BI to other dashboards, Word docs, PowerPoints, PDFs, website posts, Robotic Process Automation (RPA) systems, chatbots, Virtual Assistants (Alexa, Cortana), etc.

Deploy on premises, in the cloud, or dedicated cloud—the security of keeping your data in one place remains under your control.

Simple to complex, not all NLG is the same

Arria NLG technology is many times more powerful than simpler approaches —with the ability to achieve **ALL 5 Levels** of NLG as required.

Level 1	Level 2	Level 3	Level 4	Level 5
FILL-IN-THE BLANK SYSTEMS	**SCRIPTS/RULES CREATING SIMPLE TEXT**	**LANGUAGE FUNCTIONS APPLIED**	**DYNAMICALLY CREATING SENTENCES**	**DYNAMICALLY CREATE FULL DOCUMENTS**
Simple support for varying how data is expressed and for conditionals. Think Mad Libs or mail merge.	Adding scripting language or business rules. More sophisticated conditionals, loops, access to code libraries.	Adding word-level grammatical functions; morphophonology, orthography, and syntactic rules; and other language functions.	Linguistically optimize sentences and paragraphs using techniques such as entity references, aggregation, ordering, and connectives.	Combine advanced linguistics with advanced analytics to produce documents and well-structured narratives with insights relevant to the specific reader and use case.

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YOU'RE IN CONTROL

THE ARRIA DIFFERENCE #1

Arria NLG Studio is the most advanced platform on the market today

With Arria NLG Studio, you have the ability to create, customize and control your own NLG projects

With Arria, you create natural language generation (NLG) projects using scripts you design and data sources you supply. Each Arria NLG project can generate an infinite number of narratives that transform your data into natural-language stories and reports.

SIMPLE, FLEXIBLE, SCALABLE, AND FAST

Arria empowers writers and subject matter experts to create an effectively unlimited number of sophisticated narratives based on structured data sets. Our simple web-based interface contains a set of easy-to-understand functions that correspond to the array of analytical, linguistic and stylistic decisions a human writer makes when composing thoughtful narrative. Arria's platform is rules-based and combines advanced analytics with advanced linguistics to generate the most advanced NLG on the market today.

Studio

At the heart of Arria NLG Studio is a pre-configured set of functions used to instantly analyze data and convert it to insightful narratives.

See how it works and a technical overview of Arria NLG Studio on pages 28-31

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ADVANCED TECHNOLOGY

THE ARRIA DIFFERENCE #2

Arria combines advanced analytics with advanced linguistics

Arria NLG Studio is the only tool on the market that has built-in analytics to enable drill-down analysis and insightful language generation

Only Arria combines advanced analytics with advanced computational linguistics to automate reporting at a level equal to your subject matter experts, only infinitely faster!

The speed and consistency of Arria NLG-driven report automation is unparalleled. Arria NLG Studio narrates multiple data sources, Excel with multiple sheets, JSON data, nested data, data coming from SQL, and so much more.

"Arria NLG Studio's BI analytical and linguistic capabilities provide us with the technology to dramatically improve the speed and efficiency of our reporting. A key benefit for us is that we can use this powerful platform to create our own NLG applications within our department."

— Brian O'Connor, Lead Director, Advanced Analytics Global Business Services, AstraZeneca

Studio

Arria NLG Studio is the only NLG platform that narrates all of your dashboard's underlying data and, lets YOU build and customize your own projects.

See how it works and a technical overview of Arria NLG Studio on pages 28-31

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DATA SECURITY

THE ARRIA DIFFERENCE #3

Integrate Arria NLG into your current infrastructure of choice

Arria offers 3 deployment options: cloud, dedicated cloud, or on-premises—to accommodate your permissions and data security requirements.

Public Web-based Cloud

Ideal for multiple users, non-HIPAA/PCI data use cases; lowest price per user; fastest adoption and setup.

Dedicated Private Cloud

Arria-deployed and Arria-maintained; single customer-dedicated environment; optional integration with customer authentication.

On-Premises Client Server

Entire system behind customer firewall; customer controls all data and user authentication.

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FLEXIBLE ARCHITECTURE

Arria's RESTful API architecture allows seamless integration with any system

Arria's API-based architecture enables flexible, seamless integrations with existing workflow(s)

MULTIPLE STRUCTURED DATA SOURCES

- EXCEL
- BI DASHBOARD
- CHATBOT
- VDA
- DATABASES
- EXTERNAL DATA
- OTHER APPS

DATA IN

RESTful APIs

Ⓐ Studio

WORDS OUT

RESTful APIs

MULTIPLE PRESENTATION LAYERS

- EXCEL
- BI DASHBOARD
- CHATBOT
- VDA
- PDF / PPT / WORD
- WEB PAGE
- OTHER APPS

Arria NLG Studio provides a RESTful API at both the ingestion and presentation layers. The transactions are encrypted via TLS, and are stateless—so no potentially sensitive data is persisted. Each request is processed based on a set of predefined rules, and the generated narrative is then returned as a response to the client. This provides for seamless integration into any deployment model, and maximizes and leverages existing security models.
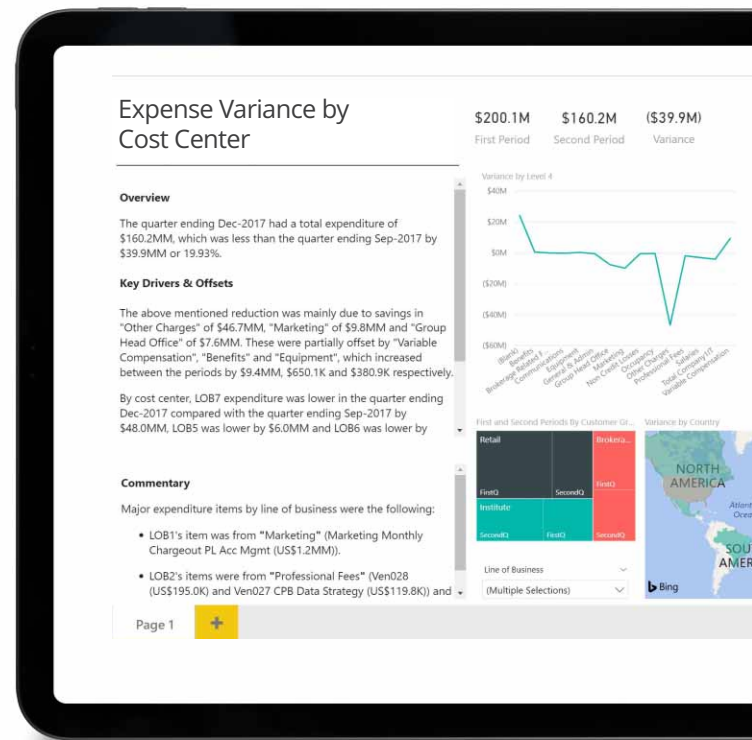
THE POWER *of* LANGUAGE

ADVANCED INTEGRATIONS

Breakthrough integrations allow you to narrate your entire dataset (beyond visuals)

Arria's **Business Intelligence (BI)** integrations aggregate and narrate *all the underlying data* available within your dashboards going well beyond two-dimensional visuals which are open to interpretation and do not typically tell the whole story. This gives you unlimited drill down capabilities with an unlimited number of dimensions from any number of external data feeds.

Extend your existing **Robotic Process Automation (RPA)** system with NLG-generated narrative summaries and reports. ArriaConnect™ is now part of UiPath's ecosystem and can be found on UiPath Go!

Bringing the power of language to **Conversational AI** is where the convergence of technologies comes to life. Arria's advanced NLG enhances virtual assistants and chatbots—shifting them from "command/respond" to dynamically generated data-driven conversations.

Arria's key integration partners include:

Power BI

+ableau

Qlik

MicroStrategy

TIBC Spotfire

UiPath

amazon alexa

"ASK ARRIA"

HAVE A CONVERSATION WITH YOUR DATA

Arria analyzes your structured data and describes it in human language. Arria instantly converts multiple data streams into fluid textual analysis that is indistinguishable from the work of trained analysts—except by the volume and speed with which it is produced. The insights contained within data are discovered and communicated in real-time, in natural language—so you are empowered to make better, more informed decisions.

ARRIA

YOU+ARRIA

Business Users
(Viewer)

"I want to interact and have a conversation with my data. I simply want to 'ask Arria' what happened, why it happened and what may happen next."

Business Users
(Editor)

"I'm not an Arria NLG project creator. But I do want to easily customize the NLG projects so they provide answers to questions I need answered."

Business Analysts
(Creator)

"I work with data regularly and know business rules, my report corpus, and KPI driver tree. I can use Arria's starter projects as a guide to build my own projects."
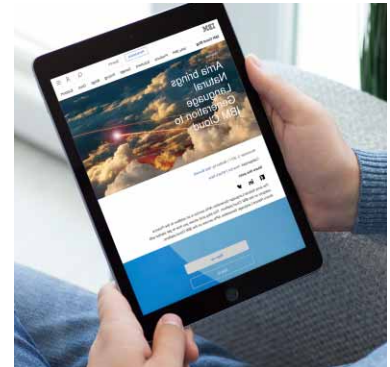
Data Scientists
(Creator)

"I analyze data and know business rules. I manage and aggregate both un-structured and structured data and can build projects to extract insights."

Developers
(Creator)

"I am a developer and script writer...I understand how to code using both structured data and unstructured text—and can build projects easily."

Partners
(Creator)

"I use Arria to build and deliver NLG applications and services to clients seeking automation, digital transformation, and NLG integrations."

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UNPARALLELED EXPERTISE

THE ARRIA DIFFERENCE #6

Arria has gathered the greatest concentration of NLG expertise in the world

Arria's team is igniting a global revolution in communications–changing the way people interact with technology

The Arria global team is one of our greatest assets. Our Chief Scientists, Prof. Ehud Reiter and Dr. Yaji Sripada, are two of the leading figures internationally in NLG science. They mentor a team that includes hundreds of PhDs (in Artificial Intelligence disciplines such as NLG and Data Science) and NLG software engineers and developers.

These experts are well-experienced at developing NLG technology and working with Fortune 500 companies and other major institutions around the world.

They possess unique knowledge and expertise in the field of NLG and how the technology can be implemented in thousands of commercial settings. In addition to the company's scientific expertise, we currently have a growing portfolio of 25 core NLG patents, with more pending.

The origins and scientific roots of NLG. From Aberdeen's ancient school of learning has emerged Natural Language Generation–one of the most advanced computing technologies ever developed.

The Arria NLG Research Centre is located at Scotland's University of Aberdeen (pictured to the left). The university's Department of Computing Science was the first to develop and commercialize Natural Language Generation technology.

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CREATING RAVING FANS

Relentlessly, obsessively dedicated to supporting our customers

We're only successful when you and your clients are successful—we do whatever it takes, no exceptions.

Expert guidance every step of the way. We assign a dedicated Arria Success Team to your organization and provide unlimited one-on-one training, in person, or remotely for all team members. We also have extensive online training and online documentation to make things easy for your team.

Our goal is to ensure your team is up and running as quickly as possible—and is enjoying the dramatic benefits NLG can offer your organization.

Concierge level service. Our team goes the extra mile, and then some. They really are obsessed with your success. They'll help you with your first use-case and then set you free to control your own NLG destiny (while standing by to help and answer any questions you have along the way).

Ⓐ Studio

Arria's reputation for excellence

Arria NLG Studio users across the globe agree: Arria knows NLG.

As a world leader in NLG, and with our proven track record of working with clients to successfully incorporate Natural Language Generation technology into their reporting and other systems, we work hard to make sure our clients receive the ROI they're expecting.

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WE INVEST IN YOU

THE ARRIA DIFFERENCE #8

Pricing options tailored to your needs so you can quickly maximize ROI

Our pricing options are aligned with usage and pace of deployment. This gives you the ability to evaluate how NLG can dramatically impact your business—and then to scale, advance, and grow as needed. You can choose from 3 pricing options:

Pay Per Viewer

Numbers of viewers are known but words generated are not controlled and/or quantifiable—e.g., Business Intelligence (BI) and other dashboards.

Pay Per Word

Numbers of viewers are unknown but words generated are quantifiable and/or controlled—e.g., static reports and applications with predictable word counts.

Pay Per Use Case

Numbers of views are unknown and words generated are not quantifiable and/or controlled—e.g., application specific models.

ARRIA NLG STUDIO USER TYPES:

Viewer - Users who view and dynamically interact with applications, such as BI dashboards, that display narratives generated from a Studio project.

Studio Creator - Users who create and edit projects that deliver narratives to Viewers and/or other remote applications.

Studio

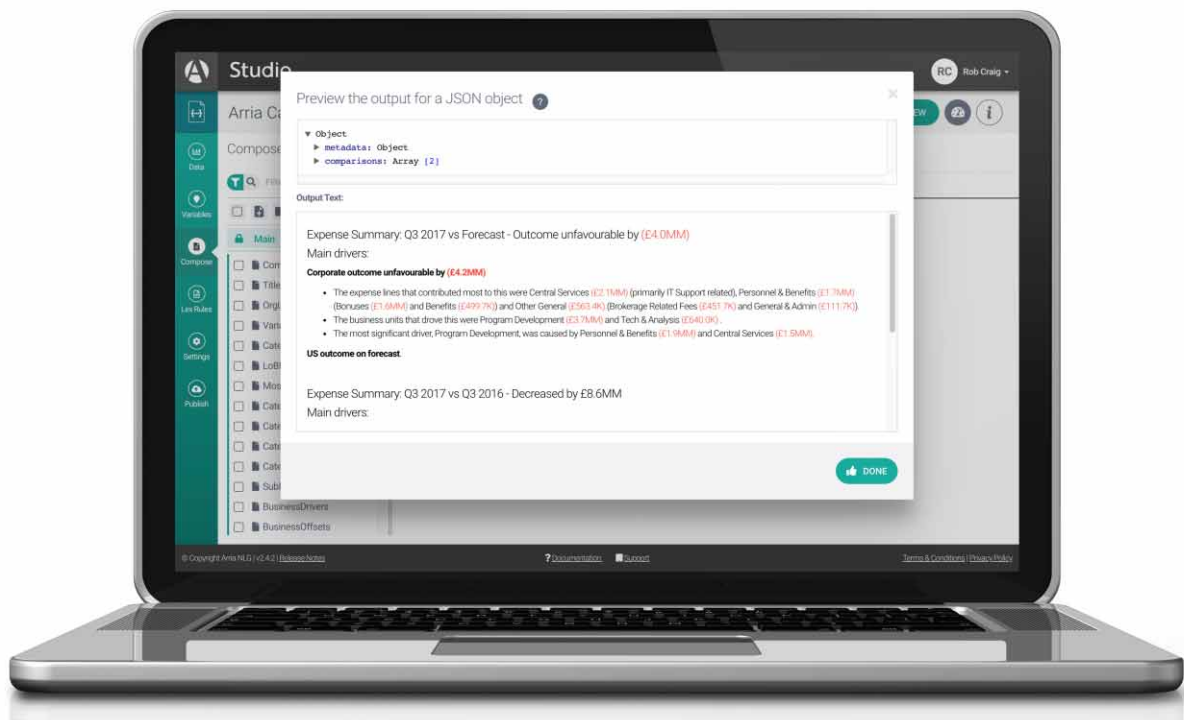### Why it's important to request a live demo

When you receive your demo of Arria NLG Studio with an Arria expert, you'll see live and firsthand the real power and value of adding NLG to your specific business use-case.

A typical demo takes about 15 minutes, and then we open up to an in-depth Q&A to address all of your questions and business requirements.

To request a demo, contact sales@arria.com or visit our website: www.arria.com.

ARRIA NLG STUDIO

A simple, fast, deployable NLG platform with the industry's
most powerful analytics and most advanced language-processing technology.

IT'S EASY! HERE'S HOW IT WORKS:

1) **You start with a story you need to tell about your data**—maybe it's a report that's already written, or maybe it's new content you want to create. You write this narrative in Studio, in scripts.

2) **In your scripts, you easily code the NLG with the help of Studio's function builder,** plus variables, conditionals, and other language logic.

3) **You publish your Studio project** as an application to run on large data sets. The auto-generated narratives vary based on the data supplied, on changes in that data, and on conditional and random variation.

4) **Your very own NLG application then delivers** auto-generated narratives to BI dashboards, websites, emails, chatbots, virtual assistants, or any system that holds the API key.

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USER-FRIENDLY INTERFACE

Arria NLG Studio lets you easily create sophisticated NLG projects that instantly generate expertly written data-driven narratives at scale.

DATA
Shows the sample data that is available to your NLG Studio project while you are building it. You can build NLG projects based on any data format (via conversion to JSON).

VARIABLES
Lists the variables that are available for you to use in your project. These are automatically generated from your data, but you can also create your own.

COMPOSE
Where you specify the content of the stories your project will generate. Here, your writing is interspersed with variables and function calls that compute values from the information in your data.
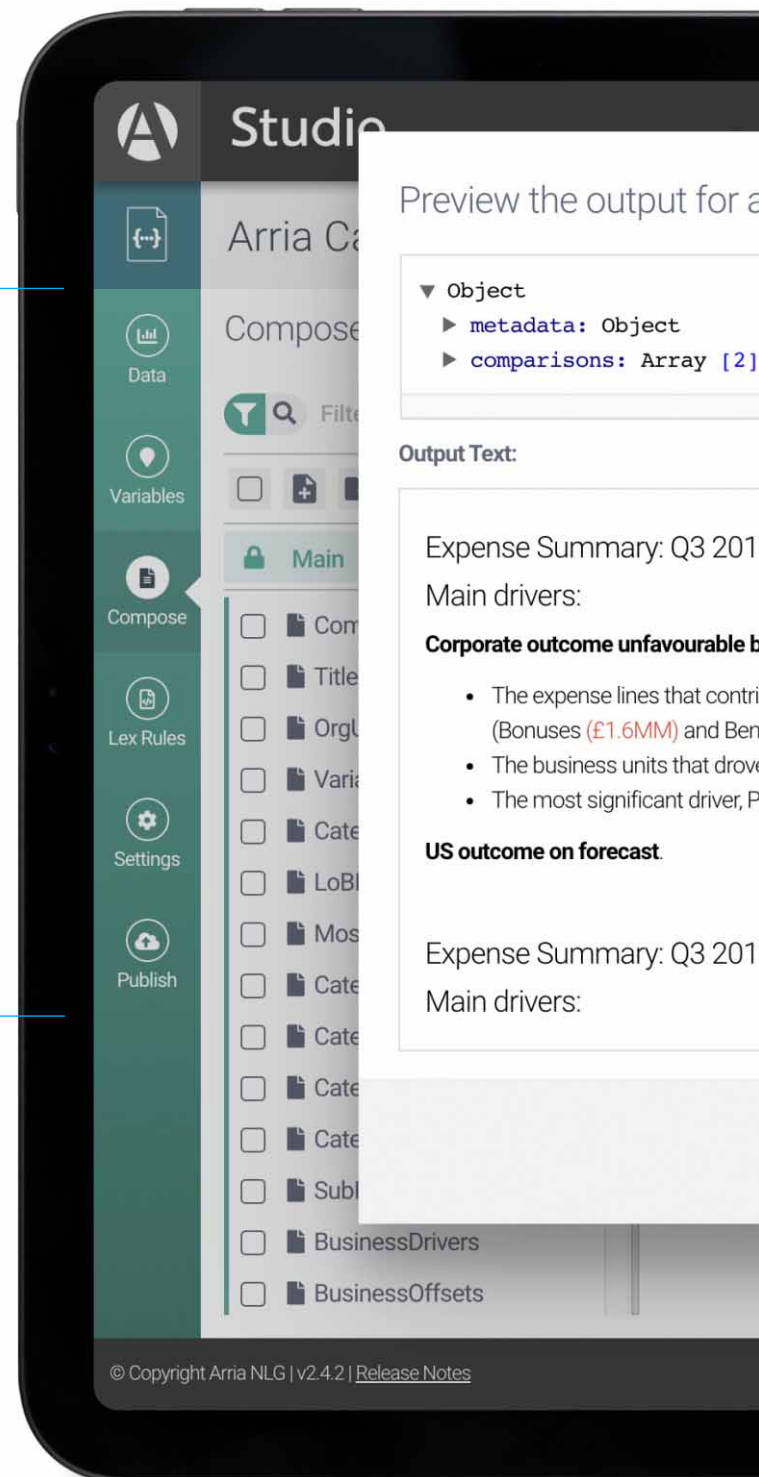
LEX RULES
Let you plan an entire sentence in one step, and you can even plan how multiple sentences relate to each other. Lexicalization rules enable you to achieve fluency and sophistication in the reports you generate.

SETTINGS
You control the properties of your project – including who has access to it and the post-processing rules you may want to use to determine the final form.
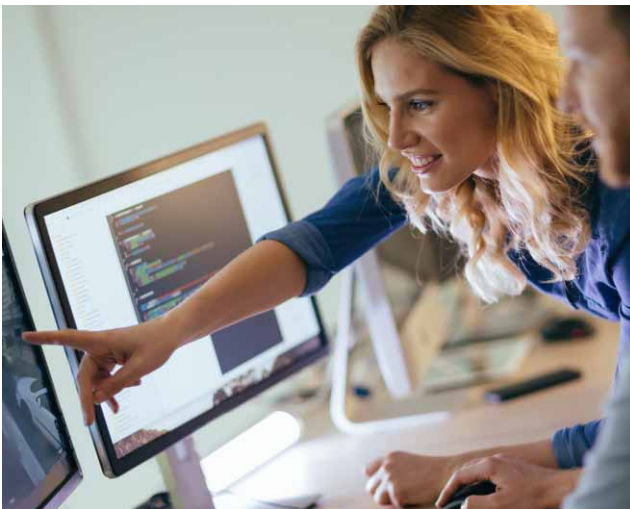
PUBLISH
Lets you run the project with different data, generate its API key, and convert your project's data into the format required to send to its API endpoint. Once you have published your project, you can run it.

TECHNICAL OVERVIEW

At the heart of Arria NLG Studio is a rich set of features and functions
used to instantly analyze data and generate text.

KEY FEATURES

Creating Projects

- Compose editor for writing and coding project scripts with ATL View, Code View, and Marked Up View
- Data view for viewing and editing sample data
- Variables view for viewing and editing the project's variables
- Lex Rules view for adding complementary lexicalization rules to JSON-type projects
- Preview mode for seeing how narratives look when generated
- Condition builder for adding data driven variation to narratives

- Automatic sentence capitalization
- Automatic *a*-to-*an* correction

Function Builder

- Helps you quickly build function calls in your scripts
- Lets you easily choose what function you want to use from those available via the drop-down menu
- Can either be invoked at the cursor position in the current script, or on a selected fragment of the script (typically a word, phrase or existing function call)

Publishing Projects

- Publish view for deploying the finished project as an API, callable via POST request
- Cross-Origin Resource Sharing (CORS)

Studio Runner

- End users of your NLG projects can generate narratives outside of NLG Studio, without having a Studio account
- Staff or colleagues who don't build

or directly revise NLG Studio projects can quickly and easily generate regular reports on-demand, based on even the most up-to-the minute data changes, by simply accessing your NLG project from the Studio Runner web page

- Lets end users submit data to a published NLG Studio project's API endpoint via the Studio Runner web page
- Offers an easy way for anyone you choose to use your NLG narrative from any web browser
- Lets users generate narratives from your project, then easily see the results on-screen, without having to be a Studio user
- Lets you more easily see how various datasets work with your project; no need to be logged into Arria when you load the data

Managing Projects
- Dashboard view for viewing, storing, and selecting projects
- Project versioning (automatically at time of publishing, or manually whenever the user wishes)
- Project sharing between team members

Other Resources
- Online library of sample projects and starter applications
- Integrated help including in-app

tutorials and context-sensitive access to external documentation
- Access to Arria NLG SDK
- Access to Arria's narrative APIs and microservices

DATA SOURCES
- NLG Studio works with CSV files and JSON data

INTERNATIONALIZATION
- NLG Studio is Unicode-enabled and compatible with data stored in any language; the Compose editor supports all Unicode fonts for narrative output

DEPLOYMENT MODELS
- Public cloud
- Dedicated instance
- Customer private cloud via Docker containers

INTEGRATION
NLG Studio integrates with a growing list of Business Intelligence, RPA, and Conversational AI platforms, including:
- Microsoft Power BI, Qlik Sense, Tableau, MicroStrategy, UiPath, and Alexa
- Coming soon: Excel and Spotfire

SECURITY
- Arria NLG holds ISO 27001:2013 Accreditation to ensure the confidentiality, integrity and availability of client data

Studio

ARRIA REVIEWS

Gartner

"Arria is a world leader in NLG"

"Arria is a world leader in NLG, with 23 core NLG patents. Its Arria NLG Studio product is an enterprise-level, self-service NLG design tool with advanced analytics and linguistic functions that enables users to easily create, edit and publish NLG narratives. Arria solutions are deployed globally."

— **Gartner**, *"Market Guide for Natural Language Generation Platforms"*

AstraZeneca

"Dramatically improve the speed and efficiency of reporting"

"Arria NLG Studio's BI analytical and linguistic capabilities...dramatically improve the speed and efficiency of our reporting. A key benefit for us is that we can use this powerful platform to create our own NLG applications within our department."

— **Brian O'Connor**, *Lead Director, Advanced Analytics Global Business Services, AstraZeneca*

UiPath

"Easily automate reports previously written by a human"

"UiPath's automation platform combined with Arria NLG's platform helps bridge the communication gap between robots and humans...customers can easily automate reports previously written by a human with the NLG activity for UiPath Studio."

— **Dhruv Asher**, *SVP, Head of Business Development and Product Alliances, UiPath*

ARRIA REVIEWS

FORRESTER

"Arria is a Leader with robust writing automation and analytics"

"Arria is a Leader with robust writing automation and analytics capabilities. We found Arria's writing automation capabilities to be the most comprehensive among all participants. Its founders have written definitive books on NLG and hold more than a dozen patents on the technology… Arria is best for companies that need a "space shuttle" for writing automation. If your writing automation and NLG for analytics call for the top-of-the-line capabilities with a comprehensive IDE, and a myriad of rules and templates, Arria is a perfect fit for you.

— **Forrester** *"New Wave Report: Natural Language Generation For Analytics"*

BNY MELLON | **EAGLE** INVESTMENT SYSTEMS

"Arria's industry leading NLG capabilities"

"We're excited to offer our clients access to Arria's industry leading NLG capabilities to help our clients utilize and analyze their data stored within the Eagle platform. We're working with Arria to build a set of capabilities in portfolio management, portfolio analysis and performance measurement that will help our clients significantly reduce the amount of time they spend writing personalized client summaries and reports and allow them to spend more time interacting with their clients."

— **Joel Kornblum**, *Global Head of Strategic Alliances, Eagle Investment Services*

For more reviews, visit arria.com

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POPULAR USE CASES

Enterprise Report Automation

- Profit & Loss
- Balance Sheet
- Cash Flow
- Revenue / Sales
- Expense Variance
- HR Performance
- Trend Analysis
- Marketing Campaigns
- Credit and Risk
- And more...

Investment Report Automation

- AML – Fraud Detection
- Attribution Commentary
- Fund Commentary
- Market Update
- Portfolio Performance
- Risk Analysis
- Stress Testing
- Trade Activity
- Wealth Management
- And more...

Clinical Safety Report Automation

- Adverse Events
- Clinical Trial
- Clinical Safety
- Decision Support
- EMR Reporting
- Nurse Shift Handover
- Patient Reports
- Regulatory Reporting
- Risk Management
- And more...

These are just a few of our most popular NLG use cases.
Visit arria.com to see many more.

UNITED STATES | CANADA | UNITED KINGDOM | EMEA | AUSTRALIA | NEW ZEALAND