When Everything is Data, Discover What Matters!

Udo Sglavo
Vice President, Applied AI & Modeling
Where SAS was first created which, you may recognize as Cox Hall
The first SAS office which, you may recognize on Hillsborough Street
SAS is a cloud native data and AI company
Five Decades of Innovation And Profitability

SAS PROUDLY SUPPORTS CUSTOMERS ACROSS INDUSTRIES INCLUDING

- Banking
- Capital Markets
- Communications
- Education
- Energy and Utilities
- Government
- Health Care
- Insurance
- Life Sciences
- Manufacturing
- Retail
- Services

SAS continues to record more than $3bn in sales

ANALYSTS RANK SAS AS A LEADER IN

- Artificial Intelligence
- Machine Learning
- Data Science
- Predictive Analytics
- Data Quality
- Decisioning
- Cross-Channel Marketing Hubs
- Risk Management
- Customer Analytics
- Fraud Management
- Anti-money Laundering

YEAR ON YEAR GROWTH

- SAS Viya: +30%
- Cloud: +30%

SALES BY REGION

- Asia-Pacific: 36%
- Americas: 51%
- EMEA: 13%

90% OF THE FORTUNE 100 (OR THEIR AFFILIATES) ARE SAS CUSTOMERS

Note: average count over the last five years

This summary includes amounts and percentages determined on a management reporting basis, which may differ from GAAP reporting.
Employees
12,000

Countries
140+

Customer Sites
70,000
R&D Centers
4 US, China, India, UK

Partners
1700+
3 primary drivers: increased approval rates, reduction in false positives and improved fraud detection

Consumers

Models

Variables

Enhanced results

Tangible outcomes

$770K monthly return

$1.68M fraud exposure reduction

$2.45M net monthly benefit
April 16-19 | ARIA LAS VEGAS

“We’ve solved hundreds, if not thousands, of individual customer challenges. Models are how we productionize use cases on SAS® Viya.”

UDO SGLAVO
Vice President of Applied AI and Modeling at SAS
Generative AI
SAS and Generative AI

**Data & AI Platform**
Leverage LLMs at an Enterprise Level
SAS Viya enables the orchestration of LLMs usage, integration with decisioning workflows, machine learning and data protection capabilities.

**Copilots**
Accelerate AI Lifecycle Tasks
Use SAS Viya faster and easier, leveraging Copilots that democratize ALC tasks, for increased user productivity. Such as generate code, generate dashboards, run data quality checks.

**AI Assistants**
Execute Business & Industry Tasks
Empower individuals to do their job better and faster using AI assistants specialized in enterprise use cases across different industries.

**Synthetic Data Generation**
Mitigate Data Quality & Scarcity
Address and mitigate data privacy, data scarcity and bias challenges by generating and validating synthetic data in a programmatic or UI-driven form.
SAS and Generative AI

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Copilots

Automatic SAS code generation

```sas
/* create a normal distribution dataset */
proc sgplot data=sashelp.class;
    /* Define the distribution plot and specify the normal distribution */
    histogram weight / showdensity proportion;
    density weight / type=normal;
run;
/* Import the necessary libraries for statistical analysis */
proc univariate data=sashelp.class nogram;
    histogram weight / normal;
run;
```

The UNIVARIATE Procedure
Copilot Demo – Jon Leirer, SAS
AI Assistant for Inventory Planning

Digital assistant to democratize the use of SAS analytics across various personas by enabling them to interact with SAS analytics through conversation in natural language.

Natural Language Input (GPT ChatBot) → ChatGPT (Function API) → (UI + Custom API) → ChatGPT (Function API) → Natural Language Output (GPT ChatBot)

- Conversation Input
- Parse input and apply to function call via API
- Send function to SAS for processing
- Optimization Solution Parsing to NL
- Conversation Output

SAS Viya (SAS Optimization)
AI Assistant for Inventory Planning

AI Assistants to help with industry focused tasks

WEEK NUMBER: 38. [ Click here for Visual Analytics Report ]
LAST UPDATE: Tue 28 Nov 2023, 12:02PM

SCENARIO SUMMARY: [ Current Scenario: BaseScenario ]

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Util Before</th>
<th>Util After</th>
<th>HDC --&gt; Overflow</th>
<th>Overflow --&gt; HDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>BaseScenario</td>
<td>96.0%</td>
<td>82.0%</td>
<td>MATS: 607 [PLTS: 12,339]</td>
<td>MATS: 47 [PLTS: 4,290]</td>
</tr>
</tbody>
</table>

Chatbot

Hi there! What can you do for me?

6. Hi there! I'm a space planning assistant and I'm here to help you with SKUs, demand planning, and the tools present for you. What can I do for you?

6. Run space optimization for current week and summarize results

6. Space Optimization complete! We recommend moving out (HDC --> Overflow) a total of 607 materials (12,339 pallets), and moving in (Overflow --> HDC) a total of 47 materials (4,290 pallets). Based on this recommendation, the HDC Utilization will change from 96.0% to 82.0%. Ask me if you would like a list of which items to move-in or move-out.

6. What are recommended ambient items to move out?

6. Based on the optimization model results and ONLY considering quantities greater than or equal to 100, we recommend moving out (HDC --> Overflow) 11 materials (2,061.0 pallets). Here is the list of top 10 materials to move out:

Type a message...
Mitigate Data Quality and Scarcity

- Prepare Source Data
- Generate Synthetic Data
- Explain and Validate Output
Opportunities for Quantum Computing

- Drug Discovery
- Financial Modeling
- Chemical Simulations
- Optimization
Traditional Computing and Optimization
Traditional Computing and Optimization

Distance Traveled

Time

Best Solution
Power of Quantum Computing
Causal Statistics and Econometrics
Importance of Causal Analytics

**Why is causality important?**
- There are causal-and-effect questions everywhere in economics and statistics
  - Currently the inflation rate is high, what if we increase the tax, decrease the tax, or increase some people’s taxes but decrease others’ taxes?

**THINK REGRESSION**

\[ y_i = \alpha + x_i\beta + \varepsilon_i \]

- Is \( y \) truly caused by \( x \)?
- Is it the other way around?
- Are other effects impacting both \( y \) and \( x \)?
- What can be done to determine causation?
Example: 2021 Nobel Prize for Economics
Angrist and Imbens

- Research impact of completing high school on earnings
  - Some variables impact both earnings and completion of high school
    - Violation of regression assumptions
  - Solution: Used specialized methods available in SAS
Causal Inference

PROCs in SAS

- Causal Discovery
  - CAUSALDISCOVERY

- Causal Graph
  - CAUSALGRAPH

- Causal Estimation
  - BART
  - CAUSALMED
  - CAUSALTRT
  - DEEPRETC
  - DEEPPRICE
  - PANEL
  - VARMAX
  - ...
Day in the Life of a SAS Intern
Exciting news! We're honored to be recognized by Handshake with a 2024 Early Talent Award. The #EarlyTalentAwards recognize top workplaces for Gen Z talent, and we're proud to be a place where passionate problem-solvers develop meaningful careers. Learn more: http://2.sas.com/6188k3opC #saslife
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Apply for (Early) Career Opportunities

sas.com