



Hva er nytt i Viya 2020/2021 på tvers av den analytiske livssyklusen!

SAS® Analytics FANS møte

11 mars 2021

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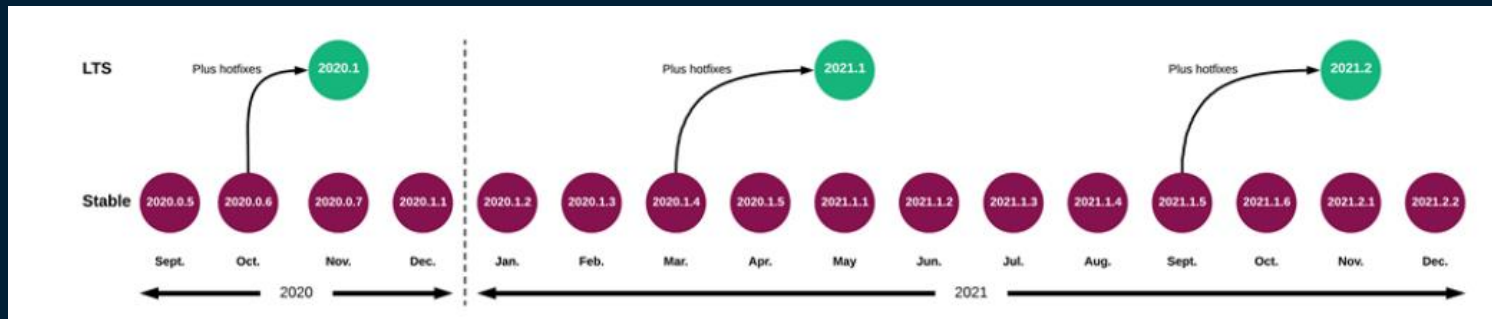
Hva betyr overgangen til CI/CD basert utvikling i SAS

For kunden:

- Ny software blir tilgjengelig for kundene hver måned
- Slutt på store oppgraderingsprosjekter
- Samme versjonsnr på all software
- Raskere å få stabil bugfix
- Mer ny funksjonalitet

Internt i SAS:

- Mindre tid brukes på å integrere og test software pga automatisering
- R&D team kan jobbe mer uavhengig av hverandre
- Mindre og mer avgresende tjenester forenkler utviklingsprosessen
- Grensesnitt mellom team styres gjennom API'ene



CONTINUOUS DELIVERY CADENCE



Stable releases

- Once a month
- Release includes new features, changes to feature, bug fixes, etc.
- Target customer:
 - Wants most up to date version
 - Wants to take full advantage of the value of SAS products
 - Software-as-a-Service customers



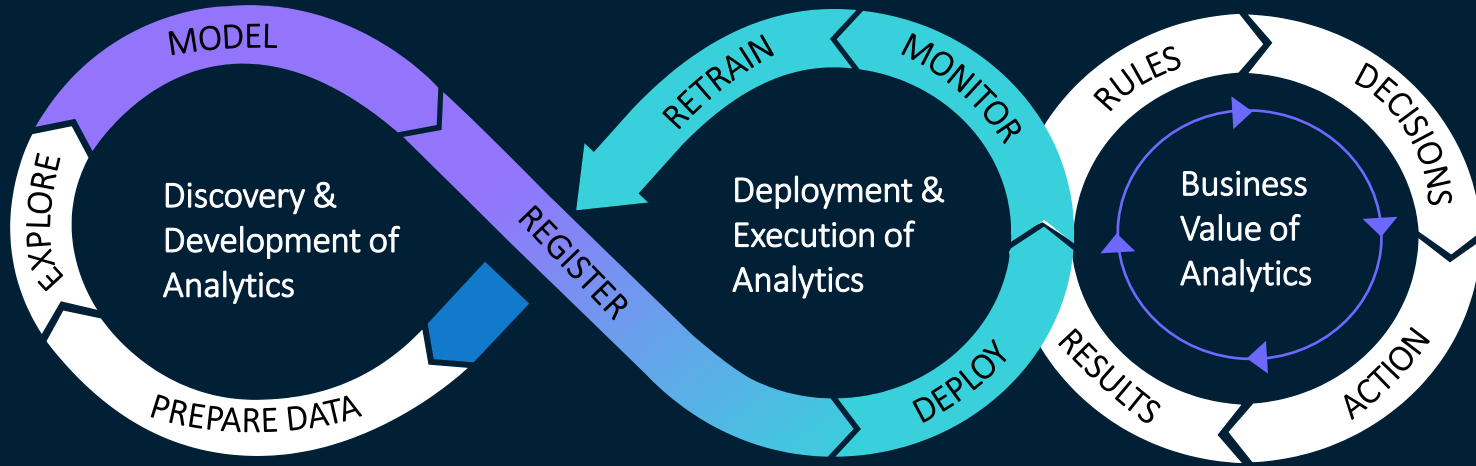
Long Term Support (LTS) releases

- Every 6 months
- Release is based on the stable releases
- Target customer:
 - Wants to upgrade on a less frequent basis
 - Need to validate their environment or operate in a regulated domain
 - Want to wait and see what happens with SAS' continuous delivery

SAS 9 to SAS Viya 4 Migration Scorecard

| Component | Content Assessment | Now SAS Viya 4 | 4Q2020 | 2Q2021 | 4Q2021 |
|---|--------------------|----------------|--------|--------|--------|
| SAS Visual Analytics Reports & VDB Queries | ● | ● | | | |
| OLAP Cubes | ● | ▲ | ▲ | ▲ | ● |
| Relational Information Maps | ● | ▲ | ▲ | ● | |
| Consuming EBI Data in SAS VA and SAS Studio | ● | ● | | | |
| Stored Processes | ● | ▲ | ▲ | ● | |
| SAS Code | ● | ● | | | |
| Multiple Server Contexts | ● | ● | | | |
| Libraries and Authorizations | ● | ● | | | |
| SAS Enterprise Guide Projects | ● | ⬮ | ◆ | ▲ | ● |
| SAS Data Integration Flows | ● | ⬮ | ⬮ | ▲ | ● |
| SAS Enterprise Miner Projects | ● | ⬮ | ⬮ | ◆ | TBD |

Hva er den analytiske livssyklusen?



ANALYTICS

IT

BUSINESS

Released

- Containerized SAS Viya components
- Native Kubernetes experience on Azure AKS
- Native support for Azure AD, Azure DB for PostgreSQL
- Viya on SAS Cloud
- my.sas.com self-service portal
- sas-viya CLI and plug-ins
Viya 2020.1
- RHEL 8 support
Viya 3.5

Now

- Analytics Pro [for Viya]
2020.1.5
- Viya supported on
 - Amazon Web Services (AWS)
 - Google Cloud Platform (GCP)*2021.1*
- Security improvements (Kerberos support, FedRAMP and FIPS compliance)
2021.1
- Viya supported on Red Hat OpenShift (on-prem VMware vSphere)
2021.1.1

Next

- Viya supported on
 - Open Source Kubernetes
 - Red Hat OpenShift OpenStack
 - Red Hat OpenShift Bare Metal*2021.1.2*
- CAS data layer optimization
2021.2
- Workload Management
- SAS services integrated with Azure ML and Azure Synapse
- SAS services integrated in Microsoft Power Platform
2021

Future

- Other on-prem and hybrid Kubernetes environments
 - VMware Tanzu
 - HPE Ezmeral
 - Azure Arc
 - Google Anthos
 - others TBD
- Other Red Hat OpenShift environments
 - Azure/managed
 - AWS/managed
 - GCP/managed
- Additional support for commodity services on cloud providers
- Additional security enhancements for compliance



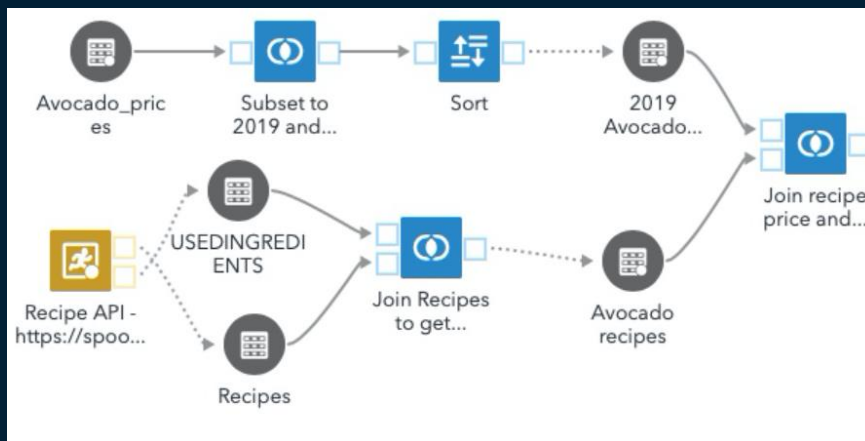
SAS Viya

SAS Studio

Introducing Flow

SAS Studio has a new Flow object

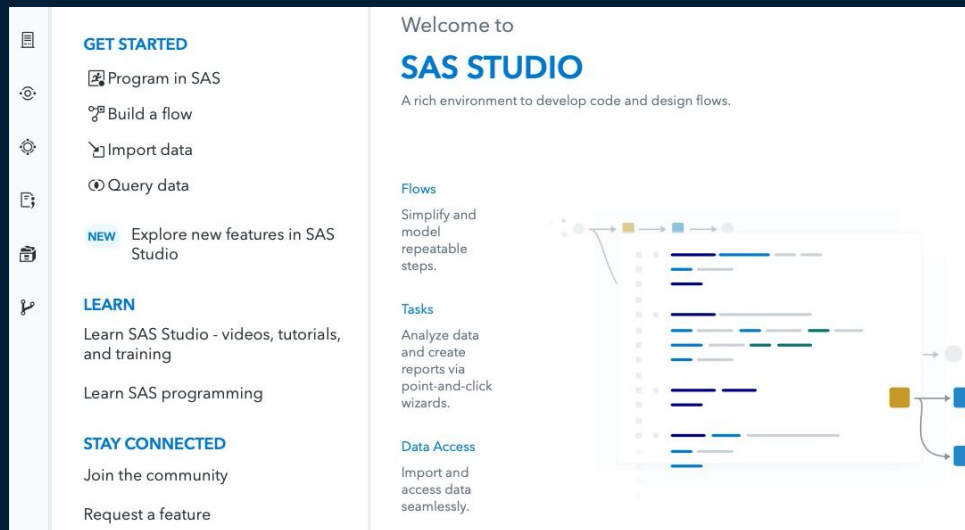
- Users are familiar with flows from EG and DI
- Visual interface
- Orchestration
- Management
- Optimization
- Self documenting



What's Cool in SAS Studio?

Single Interface with many capabilities

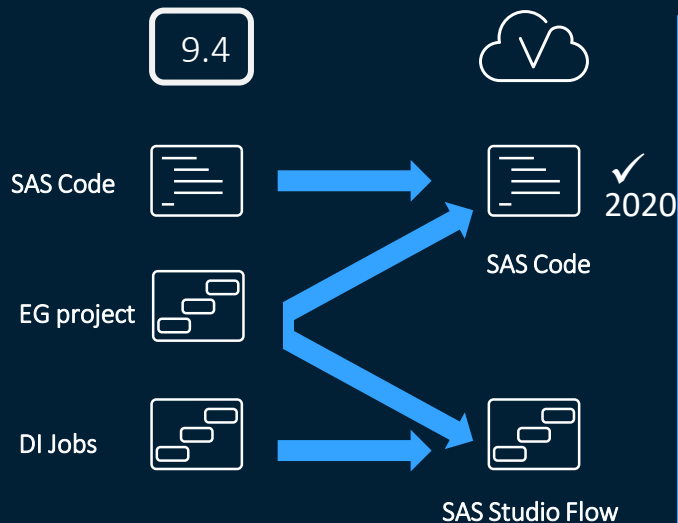
- SAS Programming environment
- Run code in SAS Compute Server, CAS Compute, or in data platforms
- Access Data
- SQL Query builder
- Tasks
- Snippets
- Flows
- Collaboration
- Automation



The screenshot displays the SAS Studio user interface. On the left is a vertical sidebar with icons for navigation. The main content area is divided into two columns. The left column contains a 'GET STARTED' section with links for 'Program in SAS', 'Build a flow', 'Import data', and 'Query data'. Below this is a 'NEW' section for exploring new features, a 'LEARN' section for videos and tutorials, and a 'STAY CONNECTED' section for community and feature requests. The right column features a 'Welcome to SAS STUDIO' message, followed by sections for 'Flows' (simplifying repeatable steps), 'Tasks' (analyzing data and creating reports), and 'Data Access' (importing and accessing data). A diagram on the right illustrates a flow process with various steps and data sources.

Migration from 9.4 to SAS Studio

A Phased Approach



Progressive Supported Migration Levels:

1. EG Project to Code
2. EG Project to Flow – Code Based
All EG nodes to SAS Program steps
3. EG Project to Flow – Like to Like
Most used EG nodes to similar steps :
Query->Query 1st then Import, Export, Sort
4. As full a conversion as possible
including prompts and referenced programs
5. Migration with automated testing
and execution and design
optimizations

Released



Studio Flow GA release

- Table, File, Import, Sort, SAS Program, Query steps

2020.1 (Nov 2020)



SAS Studio Analyst GA release

- Flow Properties
- Background Flow Submission
- Assigned Libraries Edition
- Code to Flow
- Step – Export (Delimited & Excel)
- Step - Branch Rows (Analyst)

2020.1.1 (Dec 2020)

- Step - Insert Rows (Analyst)
- Copy/Move Content between SAS Content & File System

2020.1.2 (Jan 2021)

- Step – Filter Rows (Analyst)

2020.1.3 (Feb 2021)

Now

Flow

- Autosave Support
- Temp tables and Table Output List update

Migration

- EG Projects to Flows (SAS Programs)
2020.1.4 (Mar 2021)



Custom Step Framework

Allowing users to create their own steps to be used in a Flow

- Custom Step Code Editor

Flow

- Step – Manage Columns
2020.1.5 (Apr 2021)

Custom Step Framework

- Custom Step WYSIWYG Designer

Flow

- Flow Execution Order Control
- Step – Import Update
- Step – Export Update

2021.1.2 (June 2021)

Next

Flow

- Step – Computed Columns (Analyst)
- Step – SAS Program Update

2021.1.2 (June 2021)

Flow

- Step – Job Reference, Embedded Jobs (Analyst)
- Step – Query Update
- Step – Table – Allow CAS Tables to persist
- Code Optimization (Insert Rows with Query)

Migration

- EG Projects to Flows (Query to Query)

Integration

- Studio Flows in Catalog & Lineage
2021.1.3 (July 2021)

Future

Flow

- Step - Import/Export Update
- Step – Sort Update
- Studio Tasks Conversion to Custom Steps
- Step – Python Program
- Code Optimization (Manage Columns and Filter Rows)

2021.1.5 (Sept 2021)



Studio Engineer

- General Availability
- Step - Advanced Join (Engineer)
- Step – Table Loader (Engineer)
- Step – Intelligent Decisioning (Engineer)

Migration

- Migration – EG Projects to Flows (Import/Export/Sort Support)
- Migration – DI Projects to Flows (SAS Programs)

2021.2.2 (Dec 2021)



SAS Viya

Released

- Viya 4 release of SAS Data Quality, SAS QKB, SAS Lineage, SAS Data Explorer
- QKB CI 32 release on SAS Viya 4
- Security updates

2020.1

- Security updates
- SAS QKB Customize Tool General Availability on support.sas.com

2020.1.1

- SAS Information Catalog GA
- SAS Information Governance GA

2020.1.3

Now

- Multi language Support in Discovery Agents
- Temporal and Spatial Coverage
- Information Privacy Attribute at Table Level

2020.1.4

- JanusGraph/BerkeleyDB Support

2021.1.3

Next

- Faceted Search
- Federated Content

2021.1.3

- Discovery Agents Updates
- Table Structure Metadata
- Mini Lineage
- Lineage – Migration to REACT
- Lineage – SAS Studio objects

2021.1.5

Future

- UI Improvements
- PostgreSQL to Janusgraph Upgrade & Downgrade
- Egeria Integration

2021.2.2

- Ad-hoc Analysis
- Information Catalog API
- Collaboration features
- Data Explorer End of Life
- “Semantic Classification Manager”
- “Business Data Glossaries” on SAS Viya

Future



SAS Viya

Released

- Hadoop – CDP 7.1/7.2 Support
Viya 3.5 - HotFix
- DB2 - IBM Integrated Analytics Server (IIAS) Support
- GBQ - Bulk Unload Support
- Hadoop - CDP 7.1/7.2 Support
- MongoDB – GA & Enhancements
- MSSQL - Azure Synapse Support & bulk loading
- PGSQL – EnterpriseDB Support on Google Cloud SQL PostgreSQL
- SFDC - GA + Proxy Support
- Snowflake – GCP Support + internal Bulk Load/Unload on GCP Storage
- Spark – GA
- GBQ - Google BigQuery Storage API
- Hadoop - Azure HDInsight 4.0
- MSSQL - Bulk Load on Azure Synapse (CAS) Support
- PI System – SAS/ACCESS only
- Yellowbrick - GA
Viya 4 – 2020.1.3 (Feb 2021)

Now

- Greenplum – Data Connector
- Netezza – Data Connector
- SSO Support on Azure (Synapse, MSSQL, PGSQL, MySQL)
- Spark SQL/Proc Pushdown Improvements
2020.1.4 (Mar 2021)
- DB2 – External Table Loading Technique Support
2021.1.1 (May 2021)
- MSSQL – MSSQL BDC Support
- PGSQL – CockroachDB Support
2021.1.2 (June 2021)
- Salesforce – Bulk API Support
2021.1.3 (Jul 2021)
- MongoDB – MongoDB Atlas Support
- Spark – Enhancements + Thrift dependency removal
2021.1.5 (Aug 2021)

Next

- Salesforce – Update, Insert, Delete Support
- Netezza – IPS Support
2021.1.3 (Jul 2021)
- MongoDB – Cosmos DB Support
2021.2.2 (Dec 2021)

Future

- Spark – Azure HDInsight, AWS EMR, Google Dataproc, Azure Synapse, CDP 7.2
- Spark – Azure Databricks, Google Databricks, AWS Databricks Support
- Hadoop – Google Dataproc Support
- Social Media Connectors
2021.1.5 (Sep 2021)
- Connectivity to ODATA
- Cosmos DB – Other APIs Support
Future



SAS Viya

Coming 2021

SMART

FLEXIBLE

ANYWHERE

Automation with Jobs

- Automate business logic as jobs in SAS Visual Analytics

Smarter Explanations

- Automated Explanation can better interpret and explain time and geographic based information.

Custom Region Import

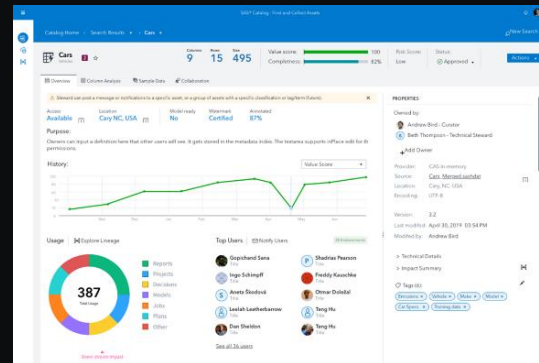
- Streamlined import of custom geographic regions to save time and help you focus on what's important.

Tabular Data Export

- Take your tabular report visualization "as-is" into Excel documents

Catalog & Search

- Common source of knowledge about data
- Graph-based metadata management system
- Elastic search queries
- User collaboration
- Flexible Tagging of datasets (trusted/low quality/approved etc.)
- AI Based metrics: most used, highest quality, sensitive data detection

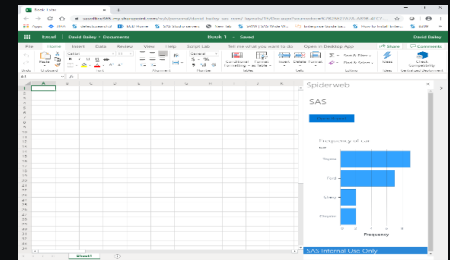


Custom Page Templates

- Share and Collaborate with creating and sharing custom page templates with your colleagues.
- Build your own mashups by import pages from existing reports

Microsoft 365

- Get your business insights in familiar Microsoft 365 applications with SAS App for Office 365
- Access SAS data in Excel for familiar excel based analysis
- Embed and interact with live SAS reports inside Microsoft 365 Office tools



Coming 2021

SMART

FLEXIBLE

ANYWHERE

Location Awareness

- Show your location on VA geo objects and use your location to filter your dashboard.

Geo Analytics

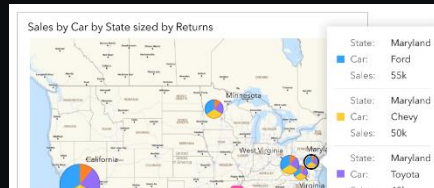
- Apply rich analytic techniques to location (spatial smoothing, clustering from geo)

More NLG Languages

- Automated Explanation, Automated Prediction, and Interpretability NLG support more languages for global customers.

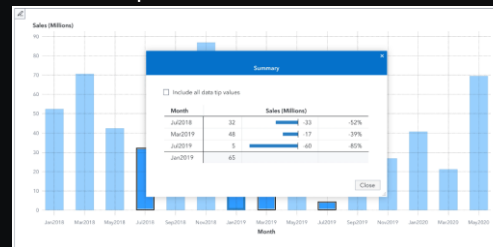
Enhanced Geomaps

- Enrich Geomaps with location-aware visuals



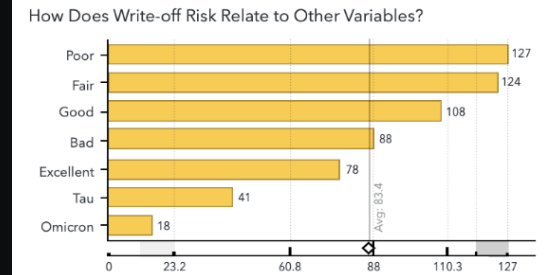
Dynamic Comparison

- Deep interactive analysis on any visualization for ad hoc data point comparison.



Smart Charts

- Suggested and auto-charted graphs are annotated with rich layer of insights about data (averages, percentages trends, etc.)
- 5 insights in 5 seconds



Microsoft Power Platform

- Deeper integration into Microsoft Azure
- Access to SAS advance and approachable capabilities within Microsoft applications
- Allow customized Power Apps with SAS capabilities

Released



- Register/Publish open source models from Model Studio

- RL – custom environment
- RL – deep-Q learning

2020.1.3

- Interactive Grouping node
- Copy/paste nodes
- Bulk scoring in MLPA
- Autotune enhancements
- Freq/Weight support in procs
- Multiple python environments
- GAM node in Model Studio
- Sequence analysis for long sequences

2020.1.1

- Gaussian Process Classification
- Node help in tooltips

2020.1.2

- MLPA enhancements

2020.1.3

Now



- StyleGAN models (images)
- Cluster astore models

2020.1.4

- Interactive Decision Tree
- Support for no-target projects
- CTGAN models (tabular)

2020.1.5

Next



- Monotonic constraints in Gradient Boosting node

2020.1.5

Future

- UMAP dimension reduction
- Tree-based imputation
- Exchange support for permissions
- Report generation in Model Studio
- Multiple targets in a Model Studio project
- Freq/weight support - Model Studio
- Segmented (by-group) pipelines
- MLPA enhancements: Add to existing project, specify sampling options, custom variable and algorithm inclusion, obtain variable profile info, direct publication
- Observation selection for local model interpretation
- Permutation importance (Shuffle Explainer)
- Bias detection, accumulated local effects
- Sampling enhancements
- Localization of insights
-



SAS Viya

Released

- Cloud Native (containers orchestrated by Kubernetes)
- Simultaneous multi-user access to projects
SAS Viya 4.0.1 GA
- Write rules referring specific XML fields
- Modified astore to provide output in DATAGRID format
- ECC to VTA conversion utility
- Performance optimizations for concepts and categories nodes
- Improvements to tmCoOccur
2020.1.1 (Dec)

Now

- End-to-end action for transcribing speech
- Speaker identification action
2020.1.2 (Jan)
- Language Identification action
- Copy to clipboard for graphs and images
2020.1.3 (Feb)

Next

- Action for generating and validating unique IDs
2020.1.4 (Mar)
- Publishable Text Analytics models
2020.1.5 (Apr)

Future

- Rules-based Sentiment models
- ML based Sentiment models
2021.1.1 (May)
- Export models in human-readable format
- XML support in Model Studio
- Business facing tools, applications and APIs
- One Pipeline, One Output: Intelligent Automation initiatives
- Text Analytics APIs: beyond core APIs
- Text Miner replacement value (planned)

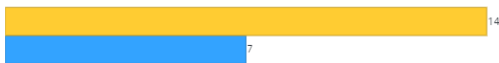


SAS Viya

SAS Model Manager

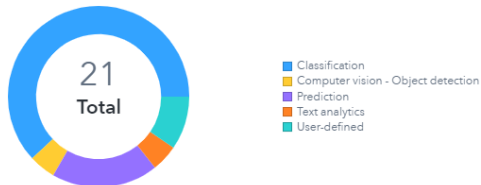
21

Total Number of Projects



7 of 21 Projects with Published Models

Projects per Model Function



Published Models per Destination




Search name

| <input type="checkbox"/> Name | ↑ | Published Status | Model Function | Location | Modified By | Date Modified |
|---|---|----------------------------------|----------------|---------------|---|------------------------|
| <input type="checkbox"/> 091d07fa-5f1f-4bd8-8306-f2afbe2d4cba | | | Classification | /Public | <input type="button" value="S"/> sbxkta | 15:11:16 10. mars 2021 |
| <input type="checkbox"/> AIRBUS_USECASE_N1 | | | Prediction | /DMRepository | <input type="button" value="S"/> sbxsee | 17:13:16 19. feb. 2021 |
| <input type="checkbox"/> Customer Churn Detection | | <input checked="" type="radio"/> | Classification | /DMRepository | <input type="button" value="S"/> sbxsef | 15:15:55 2. mars 2021 |
| <input type="checkbox"/> Customer Segmentation | | | cluster | /Public | <input type="button" value="S"/> sbxvev | 17:43:43 21. sep. 2020 |
| <input type="checkbox"/> Discover_qibs_data | | <input checked="" type="radio"/> | Prediction | /DMRepository | <input type="button" value="N"/> norico | 20:56:16 27. jan. 2021 |
| <input type="checkbox"/> Fraud Detection - Customs | | <input checked="" type="radio"/> | Classification | /DMRepository | <input type="button" value="S"/> sbxvev | 10:23:01 10. mars 2021 |
| <input type="checkbox"/> Image Classification | | | Classification | /Public | <input type="button" value="S"/> sbxvev | 17:45:41 21. sep. 2020 |
| <input type="checkbox"/> MI Risk Modelling | | | Classification | /DMRepository | <input type="button" value="S"/> sbxsef | 15:36:29 17. feb. 2021 |
| <input type="checkbox"/> MI Risk Modelling_EN | | | Classification | /DMRepository | <input type="button" value="S"/> sbxsef | 13:15:52 19. feb. 2021 |
| <input type="checkbox"/> Machine Failure | | <input checked="" type="radio"/> | Classification | /DMRepository | <input type="button" value="S"/> sbxkta | 11:36:03 11. mars 2021 |
| <input type="checkbox"/> Machine Failure Prediction | | | Classification | /DMRepository | <input type="button" value="S"/> sbxvev | 13:49:54 10. mars 2021 |



Released

- [Enhanced support for R models](#)
- Git Publishing Destination
- [New Project Wizard](#)
2020.1.1 (Dec Stable)
- Support interval target metrics in performance monitoring reports
2020.1.2 (Jan Stable)
- [Publish Python models to Azure Machine Learning \(AML\)](#)
- [New MM Home page](#)
- Simplified scheduler for Performance Monitoring
- Publish model from Model details view
2020.1.3 (Feb Stable)



Now

-  Enable OOTB KPI monitoring metrics (using existing MM variables) with WFM integration for simple notification alerting
- Support personal workspaces for repositories (supporting SAS Viya Trials)
2020.1.4 (March Stable)

Next

-  Execute custom code *(experimental)*
- Support multinomial target metrics in performance monitoring reports
- Compare multiple models within same report
- Enhanced Git Publishing
- Alert management for models
2020.1.5 (April Stable)
-  Publish SAS model to Azure Machine Learning
- New deployed models audit summary page
- Support OpenShift as a containerized publishing
- Printable KPI and alert reports
2021.1.1 (May Stable)

Future

-  Support technical promotion of models/decisions
- Create ModelOps Scoreboard
- Govern SID Decisions
- Enhanced retraining for SAS models and open-source models
- Support more OOTB Performance Monitoring plots
- Support broader Git integration
- Support Azure ML / MM common repository
- Support scoring in Azure Synapse
- SAS Solutions integration
- Enhance guided experiences
- Enhanced auditing and governance
- Support ONNX models
- Provide estimated cloud deployment costs 

SAS Viya

Released

- Asynchronous execution of process to reduce impact on decision execution
- Insert multiple rows of a real-time database insert with a single commit

Available to any solution on Viya 3.5 and Viya 2020.1

Now

- Support for SQL Server using odbc driver
- Modify MAS Core to work with python deployed in side car container
- Performance and sizing documentation
- Native datagrid support in MASCALL
- Support for client defined transaction ID in MAS endpoint
- Certify with Azure databases

Available to any solution on Viya 2020.1.4

Next

- Portable MAS – lightweight standalone containerized MAS deployment
- Metering support
- Certify with AWS databases
- Certify with GCP databases

On SAS Viya 2021.1

Future

- Hierarchical data support
- JSON schema generation for MAS input/output
- Integration with MSFT Power Platform
- Support other SAS solutions
- Support VTA and data quality functions in Viya4
- Decisions dashboard/KPI tracking
- Enhanced error reporting



SAS Viya

Released

- Compare objects
- Enhanced reusability of decision components
- Ability for business users to create more complex decisions
- Custom functions
- Enable technical users to better manage decision components in decisions
- MSFT Power Connector
SAS Intelligent Decisioning 5.5 on Viya 3.5, SAS Intelligent Decisioning 2020.1.2

Now

- UI for custom functions
- Line by line tracing
- Publish to Git
- Streamlined version management
- MASCALL UI
- Enhanced navigation between decision flow and components
- Multi-column filter
- Power Connector with webhook support
2020.1.3-2020.1.5

Next

- Governance workflow in the design environment
- Enhanced support for promotion
- Enhanced error reporting
- Flexible branch conditions
- Dynamic MAS node for published models
- Loop support

2021.1

Future

- Integration with MSFT Power Platform
- SAS CI 360, Risk, Fraud and Security Intelligence integration
- Governance workflow for decisions
- A/B testing
- Decisions dashboard and KPI tracking
- Traceability
- Decision tables
- Data assisted authoring
- Strategy simulations



SAS Viya

Released

- Azure Event Hub Connector
- Standalone ESP on Azure
- ESP Project Router Support (API)
- ESP Studio Expression Editor Enhancements
- ESP Connect (GitHub)
- Viya App Switcher support
- Kafka Connect Sink Connector
- OSISoft Pi Web connect for Linux platform
- New Audio connector
- Improved AWS Redshift Connector
- Enhanced MQTT Connector
- Enhanced and expanded streaming analytics
- QuasarDB (Time Series) Connector Support
- ESP Load Balancer cloud scalability
- Enhanced streaming analytics: summary statistics

Event Stream Processing 2020.1.1

Now

- New RADAR Data Connector
- ESPPy on Cloud/Kubernetes
- Enhanced streaming analytics: summary statistics, recommender

Event Stream Processing 2020.1.3

Next

- Enhanced Intelligent Decisioning connector
 - ESP Server Health Check Support(REST)
 - Lightweight ESP deployment instructions (+AWS)
 - Authorization Support for ESP client access control
 - ESP Load Balancer for cloud scalability
 - QuasarDB Connector De-dup support
 - Expanded Publisher Error Parsing(JSON, XML)
- Event Stream Processing 2020.1.4 (March 2021)*

- Adlink Data River connector
 - Artifact Store (Cloud/Edge)
 - Lightweight ESP deployment instructions(Google)
 - Lightweight App Switcher
- Event Stream Processing 2020.1.5(April 2021)*

- Public ESM APIs (Beta)
 - ONNX native model support
 - ESP Operations Hub
 - Expanded ESM Model deploy
 - New Annotator window for enhanced object tracking
 - New Video Capture window for streaming
 - ESP Project Router Client Support
- Event Stream Processing 2021.1 (May 2021)*

- Aerospike Support
 - New Zipper Window Support
 - Next-Gen Streaming Visualization
 - Niagara connector
- Event Stream Processing 2021.1.5 (Sept 2021)*

Future

- Edge to Cloud Architecture: Cloud agnostic (Nov 2021)
- ESP Phone Home Support
- Viya ESP content promotion support
- High Availability support for stateful ESP Projects
- Open Model Management
- Business Rule integration



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