Voice of Customer

Josefin Rosén
Nordic AI & Analytics Leader
SAS Institute

A DIGITAL MINUTE IN 2021

300.000 STATUS UPDATES

3,8 M SEARCHES

500.000 TWEETS

1.400 POSTS

13 M TEXT MESSAGES

4 M VIDEO PLAYS

50.000 PHOTOS UPLOADED

2 M SNAPS

200.000 CALLS

800.000 FİLES UPLOADED

750.000 SONG STREAMS
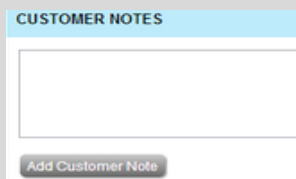
100.000 HOURS OF VIDEO

01:00

7.000 USER MATCHES

700.000 VIDEO PLAYS

WWW.SOCIALMEDIATODAY.COM

Rich textual data is collected across every part of an organization

Call Center Notes

CRM Comments

Survey Feedback

Research & Pubs

Claims & Case Notes

Live Chat

Field Notes

HR Data

Medical Records

Contract/Application

Online Forums

Blogs

Consumer Reviews

Online News
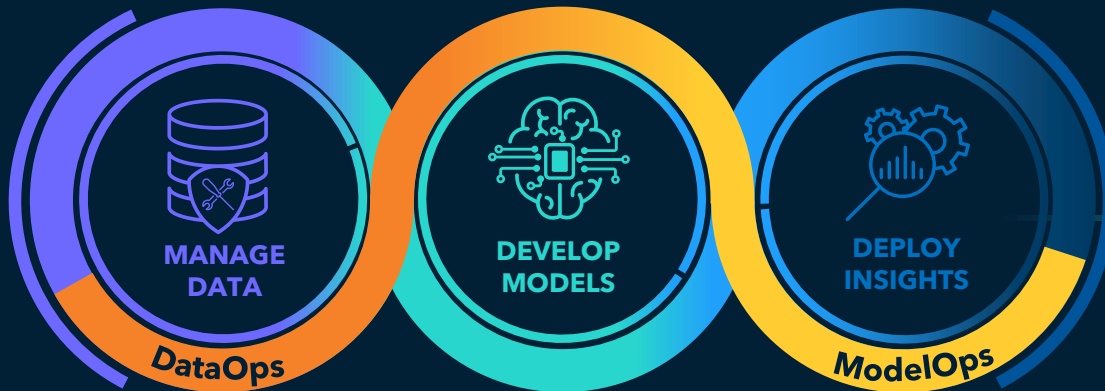
Social Networks

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Statistics
Machine & Deep Learning

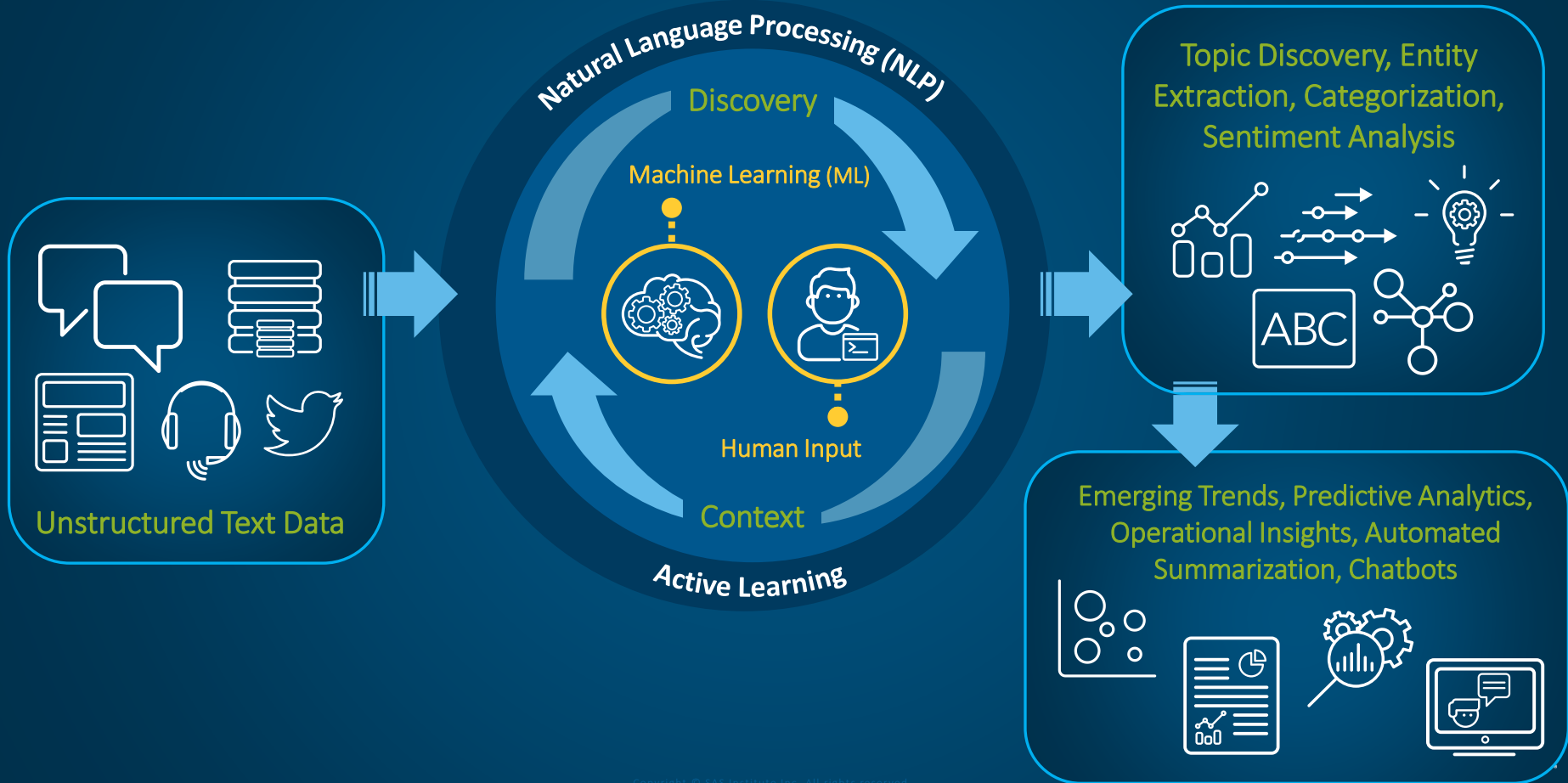Forecasting,
Optimization

Visualization

Deployment

MANAGE
DATA

DEVELOP
MODELS

DEPLOY
INSIGHTS

DataOps

ModelOps

Data
Management

Decision
Management

Natural Language
Processing

Computer &
Machine Vision

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Data + Technology + Domain Expertise

Natural Language Processing (NLP)

Discovery

Machine Learning (ML)

Human Input

Context

Active Learning

Unstructured Text Data

Topic Discovery, Entity Extraction, Categorization, Sentiment Analysis

Emerging Trends, Predictive Analytics, Operational Insights, Automated Summarization, Chatbots

ABC

Global Language Support

|		
Arabic	Greek	Portuguese
Chinese	Hebrew	Romanian
Croatian	Hungarian	Russian
Czech	Hindi	Slovak
Danish	Indonesian	Slovene
Dutch	Italian	Spanish
English	Japanese	Swedish
Farsi	Kazakh	Tagalog
Finnish	Korean	Thai
French	Norwegian	Turkish
German	Polish	Vietnamese

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SAS Visual Text Analytics

A modern, flexible and end-to-end text analytics framework that combines text mining, contextual extraction, categorization, sentiment analysis and search.
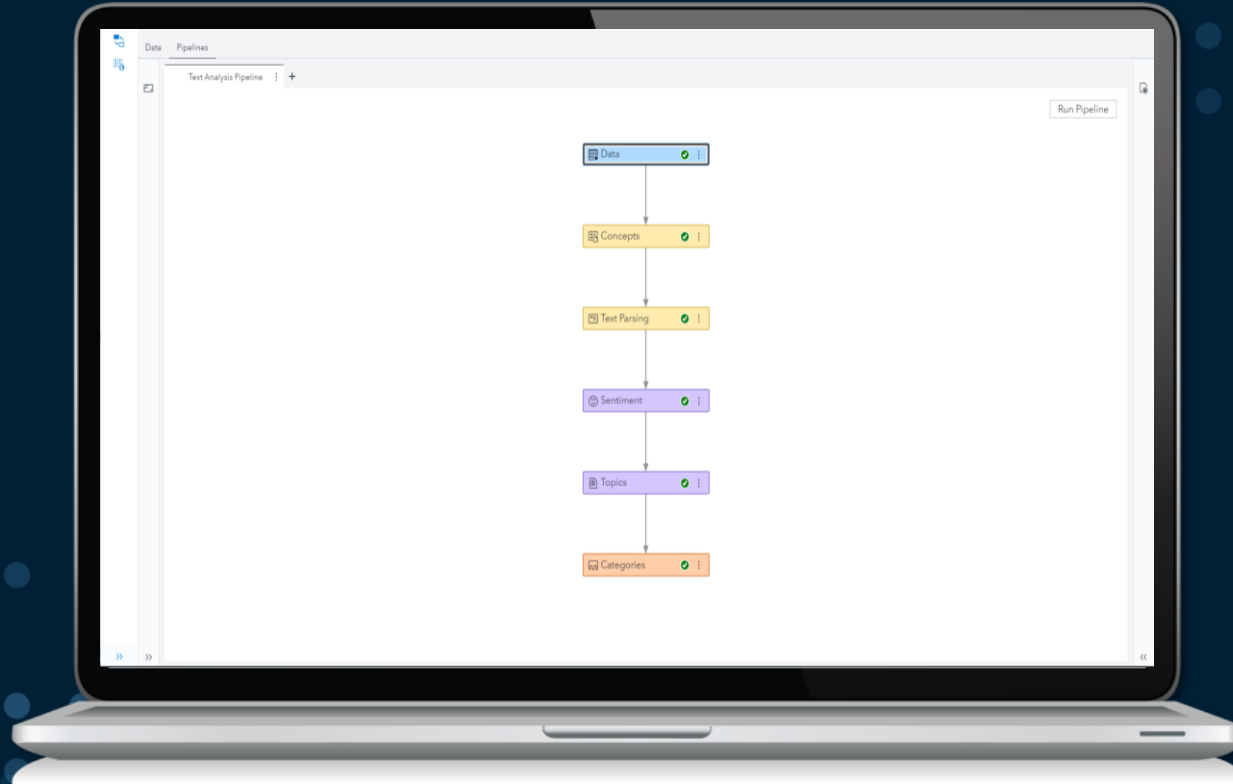
Tokenization

INPUT

"No matter what people tell you, words and ideas can change the world."
-Robin Williams

OUTPUT

| "No | matter | what | people | tell | you | , | words | and | ideas | can | change |

| the | world | . | " |

| - | Robin | Williams |

Lemmatization

has, had, haven't ⟶ have

Part of speech tagging

Pronoun
Verb
Article
Noun
Adverb
Preposition

She | knew | the | plan | needed | to | change.

He | got | change | at | the | store.

E.g. "**Will** was late for our meeting", "I **will** never do this again", "My last **will** and testament"
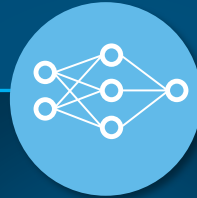
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Hybrid Approach to Text Analytics

Rule Based

Segmentation
Tokenization
Lemmatization
Part-of-Speech tagging
Concept extraction
Sentiment analysis
Categorization

Supervised

Language modeling
Part-of-speech tagging
Named entity recognition
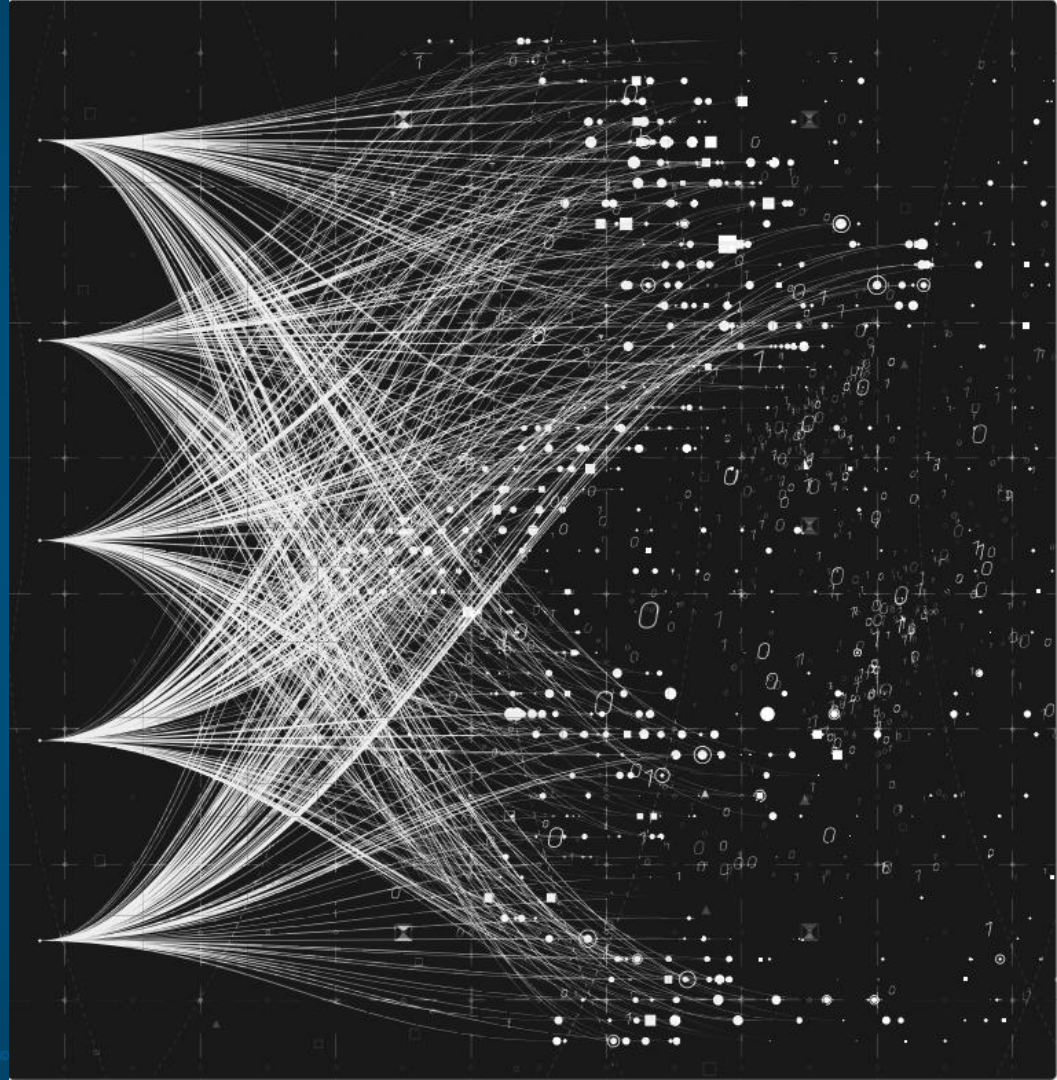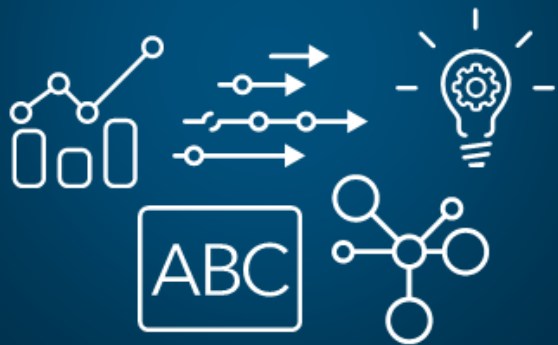Sentiment analysis
Categorization
Rule generation
Text Summarization

Unsupervised

Topic Recognition
Component Analysis

Deep Learning

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Topic Discovery, Entity Extraction, Categorization, Sentiment Analysis

My credit card company charged me {$26.00} for late fee

I live paycheck to paycheck. I check my bank account

On Thursday July 9, 2015 I left my debit card at work and I was half way home when I realized this. I immediately called Bank of America via phone and got the card cancelled and the representative said I could go to any banking cente...

Data

Text Parsing

☺ Sentiment

Sentiment Score Code

```
45      /* call the scoring action */
46   ⊝ proc cas;
47          session sascas1;
48          loadactionset "sentimentAnalysis";
49
50      action applySent;
51          param
52              table={caslib               e_name}
53              docId=&key_co
54              text=&document_column
55              language=&language
56              casOut={caslib=&output_caslib_name, name=&output_sentiment_table_name, replace=1
57              matchOut={caslib=&output_caslib_name, name=&output_matches_table_name, replace=1
58              featureOut={caslib=&output_caslib_name, name=&output_features_table_name, replac
59              :
```

score code

- Uses a set of proprietary rules that identify and analyze the document collection for:

- Terms

- Phrases and

- Character strings that imply sentiment

Based on frequency of +/- sentiment's terms, phrases or strings, the document is classified as:
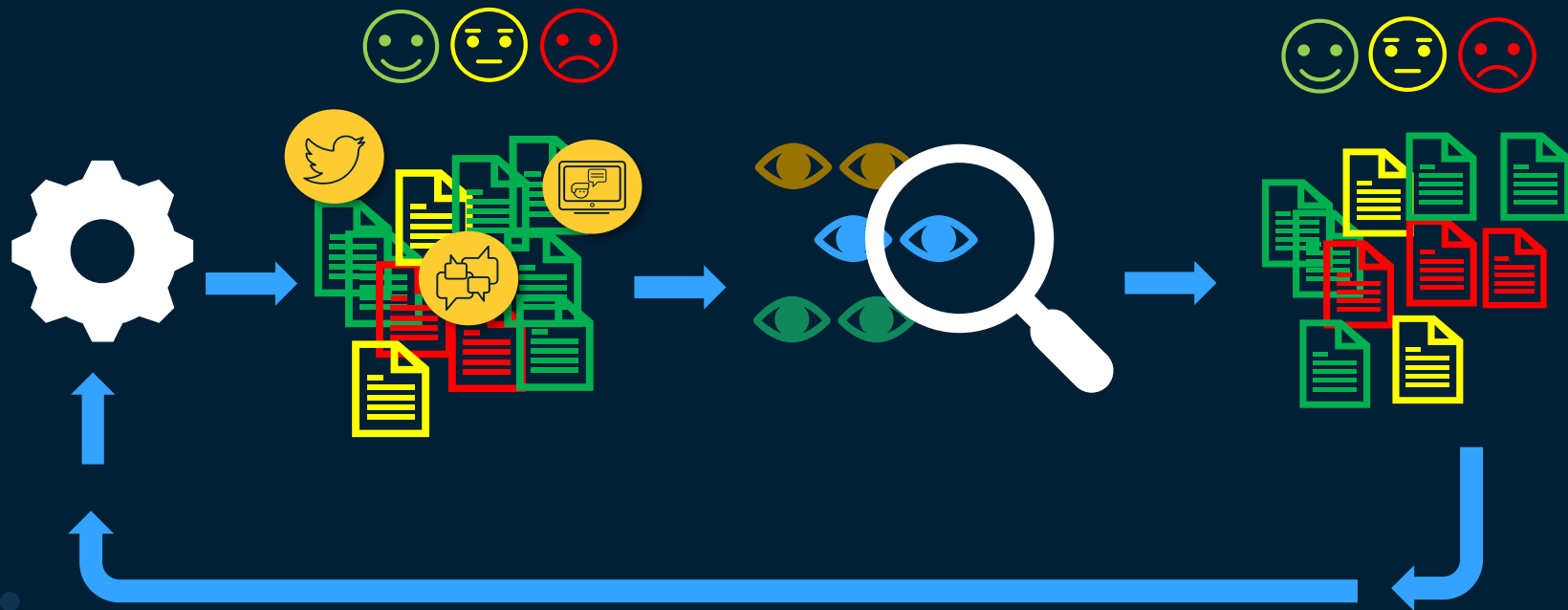
Positive

Neutral

Negative

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Model development

A Bank improved agent performance and went from analyzing only 200 webchats a month to 250,000

- Improved agent performance by increasing the number of analyzed webchats from 200 to 250,000 a month, they could identify which topics agents were handling well and areas that required improvement through trainings, establishment of best practices etc.

- Identification of root cause of poor customer satisfaction and adapting processes to fix these processes

RBS

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A Telco Company Reduced Percentage of Misclassified Trouble Tickets

- Reduced percentage of misclassified trouble tickets with 85%, resulting in a potential cost savings

- Ability to automatically identifying key topics driving number of customer calls to improve First Call Resolutions leading to higher NPS and cost efficiency

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A Diary Company is Delivering better products and services using Natural language processing

- Identified that non-homogenized milk reached its customers, which lead to corrective measures. This error was identified based on customer feedback topic around "milk looking funny" and "cream on top"

- Improve customer retention and overall satisfaction when they identified that customers prefers discount on delivery services rather than offering free delivery for a limited time

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Some more applications

Early warning

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Further Readings

Make Every Voice Heard with Natural Language Processing (e-book)
- https://www.sas.com/en/whitepapers/natural-language-processing-110641.html

Visual Text Analytics
- https://www.sas.com/en_us/software/visual-text-analytics.html

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Thank you!

✉ *josefin.rosen@sas.com*

in *www.linkedin.com/in/josefinrosen*

t *@rosenjosefin*