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Ludwigshafen am Rhein

Sentiment Analysis with SAP HANA

Hochschule Ludwigshafen am Rhein
Prof. Dr. Klaus Freyburger

3/7/2013

personal

Hochschule Ludwigshafen am Rhein

- **Prof. Dr. Klaus Freyburger**
- **1982 - 1989 studying mathematics and business administration at the University of Mannheim and University of Massachusetts at Amherst**
- **1991 PhD in mathematics**
- **1991 - 2002 working at SAP AG in Walldorf Main activities: Development of software for business planning**
- **since 2002 professor of Business Information Technology at the University of Ludwigshafen**
- **Teaching and research:**
  - **Programming**

Some figures…

Hochschule Ludwigshafen am Rhein

- **4.200 students**
- **72 full professors**
- **140 part time lecturers**
- **Wide selection of courses with business administration and social work**
  - **Bachelor Business Information Technology**
  - **Master Business Information Technology (Information Management & Consulting)**
  - **Dualer Studies Bachelor International Business Administration and Information Technology (IBAIT)**
- **Application and practice-oriented, innovative and internationally**

SAP in classroom teaching…

Hochschule Ludwigshafen am Rhein

- **Beginning 1994 R/2 as one of the first universities**
- **First, own R/3 System**
- **HCC Passau**
- **UCC Magdeburg**
- **Products used:**
  - **ERP**
  - **SCM**
  - **BI**

… and beyond

- **Students as student workers at SAP**
- **Thesiswork (Bachelor/Master)**
  - **At SAP or SAP customers**
- **Many graduates** **P and SAP customers**
- **Forme** **emp** **s a** **ssors**

UA Community

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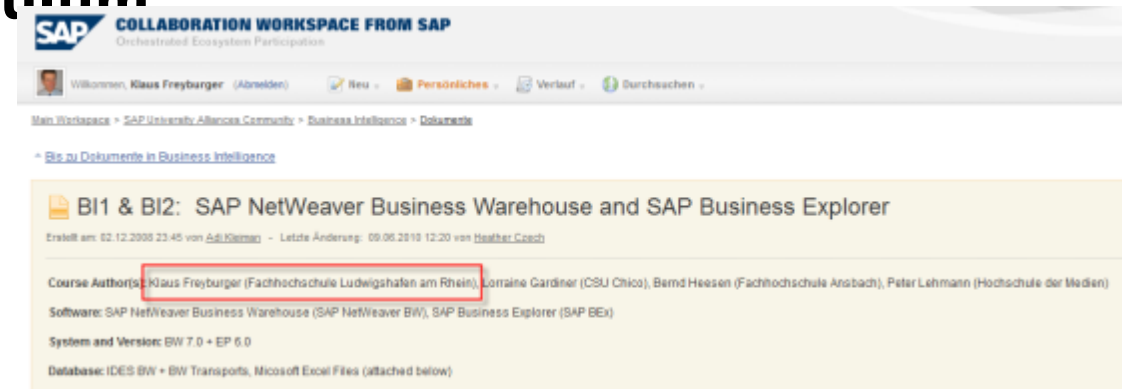
- **Leading in the development of the SAP BI curriculum**



- **… and assist in the rollout**

SAP Business Warehouse + SAP Business Objects

Inhalt der Schulung ist das neue Curriculum für Business Warehouse, das durch ein internationales Team von Professoren entwickelt wurde. Die modular aufgebauten Kernmodule umfassen «Einführung in Business Intelligence», «SAP BW Architektur», «SAP BW Modellierung», «Extract Transform and Load (ETL)», «Reporting mit SAP Business Explorer», «Reporting mit SAP Business Objects» sowie «Business Planning».
Anhand der Modellfirma „Global Bike Inc." wird der gesamte Business Intelligence Prozess mit praktischen Übungsaufgaben im SAP BW 7.0 durchgespielt und gesondert auf die Änderungen seit Release 3.5 eingegangen.
Ferner ist das Curriculums so aufgebaut, dass einzelne Teile das Thema Business Intelligence aus Anwendersicht beleuchtet und somit auch in betriebswirtschaftlichen Veranstaltungen verwendet werden können. Die Unterlagen umfassen Folien, Fallstudien und Übungsaufgaben und sind in englischer Sprache abgefasst. Abschließend wird auf den Einsatz des Curriculums im UCC Systemumfeld eingegangen.

Veranstalter:	SAP AG (University Alliances EMEA)
Dozenten:	Prof. Dr. Klaus Freyburger, FH Ludwigshafen
Dauer:	5 Tage
Zielgruppe:	Dozenten, die an einem Einsatz von SAP BW und SAP BO in der Lehre interessiert sind.

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The Project
Sentiment Analysis

Goal

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- Data harvesting from social media
- Using SAP BOE Data Services text data processing capabilities for making sense out of unstructured data
- SAP HANA data persistence for data mining, rapid retrieval and analysis
- Topic: „US Presidential Elections 2012“

Overview

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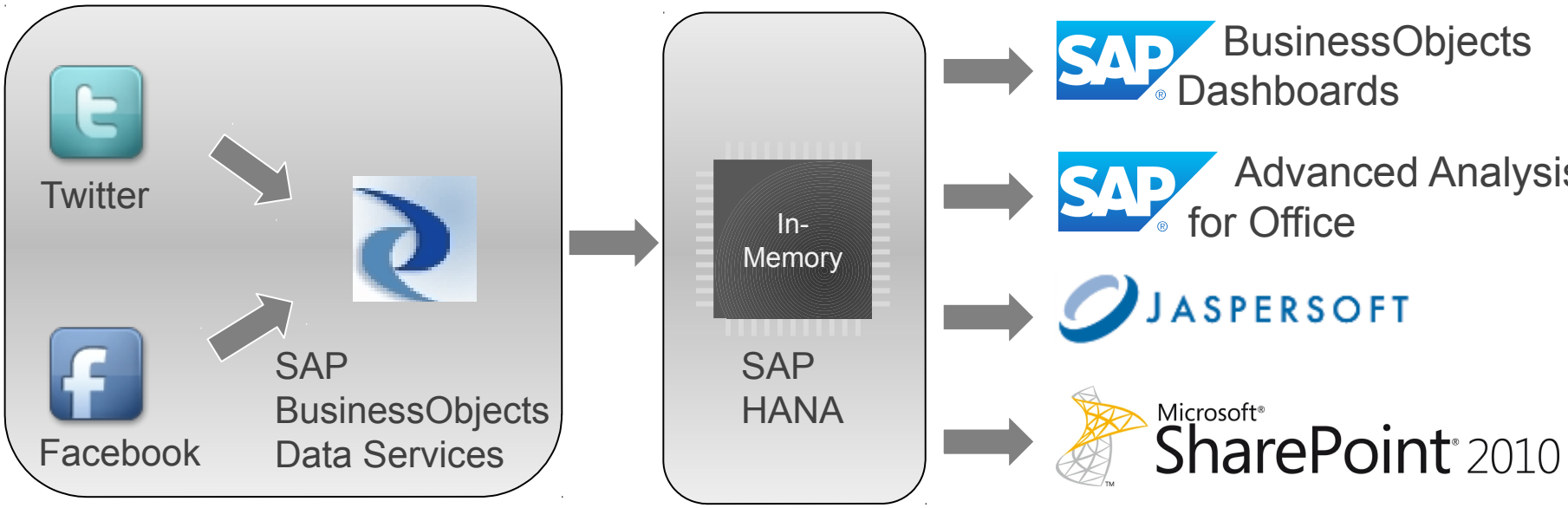

1.) Extract 2.) Sentiment Analysis 3.) Modeling 4.) Analysis

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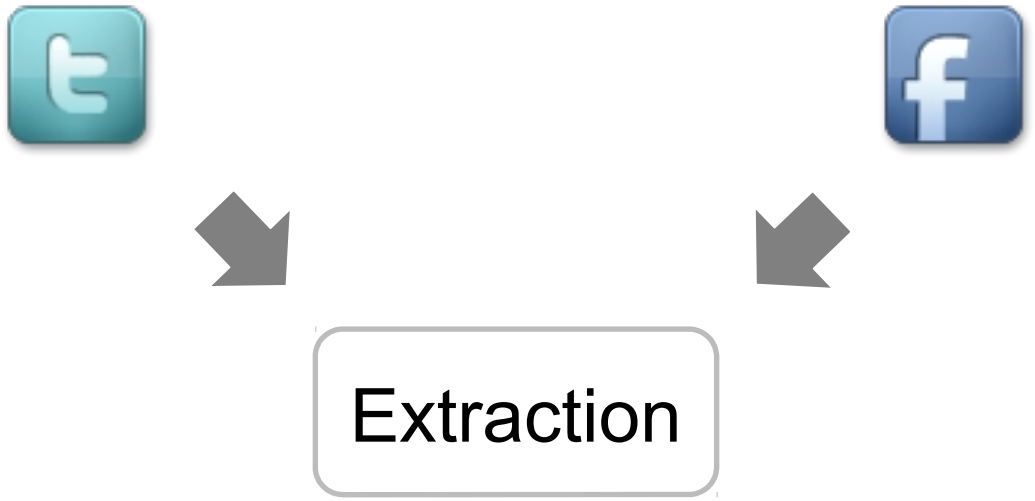
The Project
1.) Data Extraction

Extraction



1.500.000 posts per day average

> 18 posts per second

Number of posts

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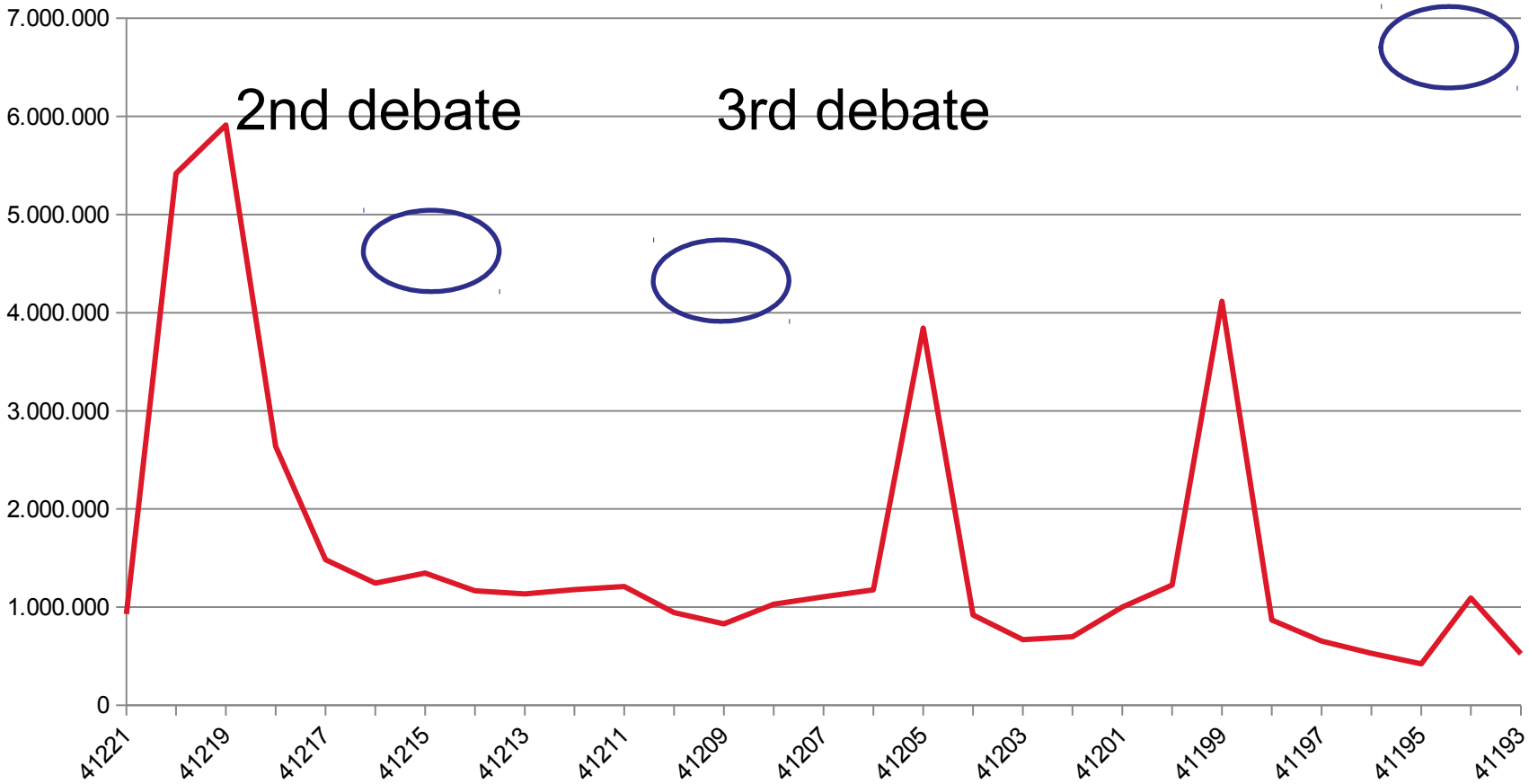
election day



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2.) Sentiment Analysis

Sentiment Analysis

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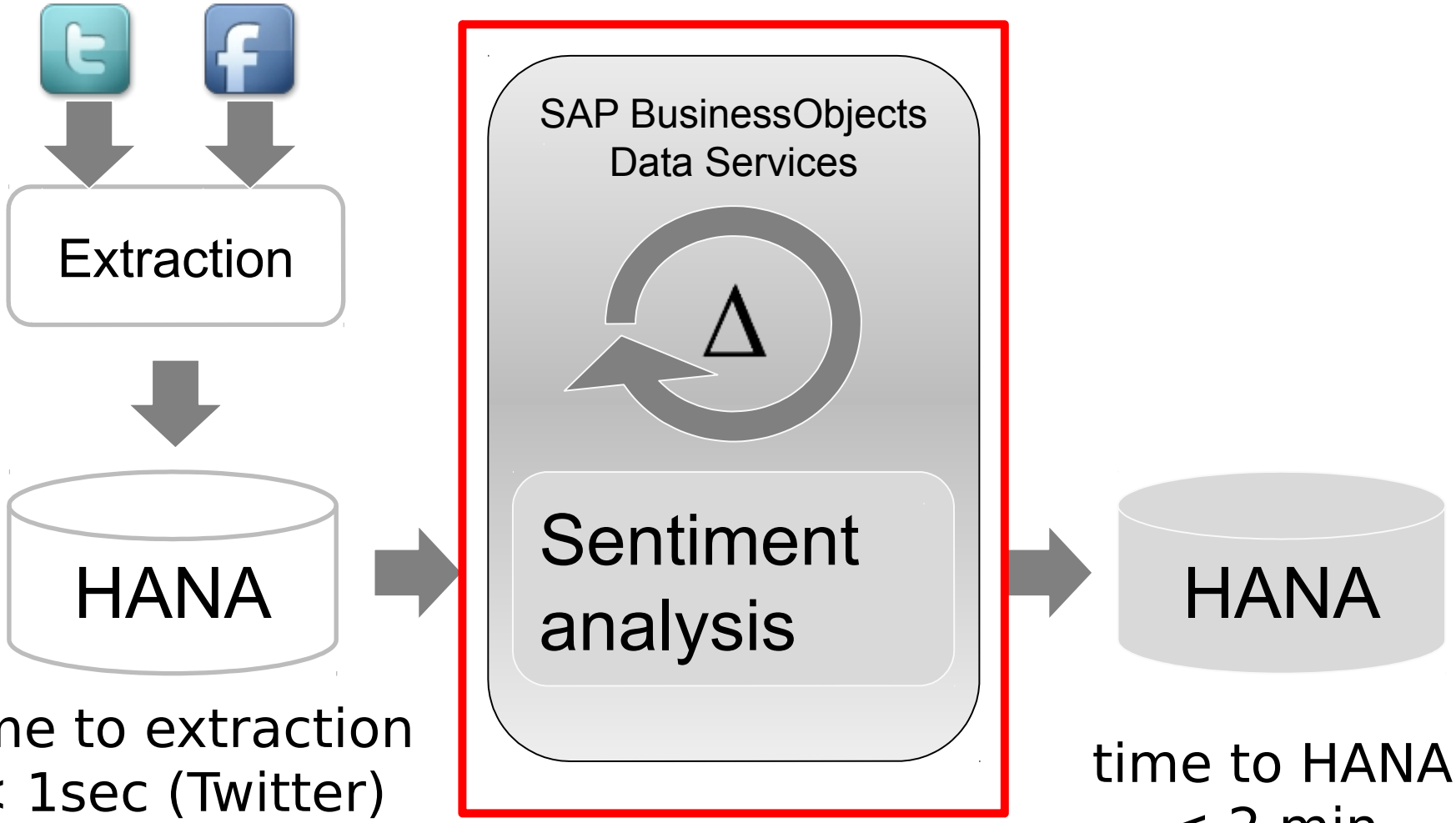

time to extraction
< 1sec (Twitter)

time to HANA
< 2 min

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SAP BusinessObjects Data Services Workflow

Sentiment Analysis

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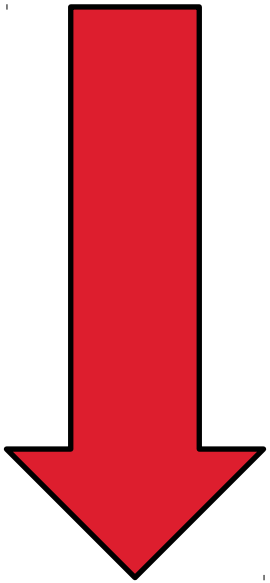
Incoming posts

Extraction of entities

Linguistic analysis



find opinions about a person / topic

Homogenization

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Obama is great.

Barack is great.

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Dictionary

Barack is great. **Obama** is great.

Sentiment Analysis

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Incoming posts

Extraction of entities

Linguistic analysis

find opinions about a person / topic

Linguistic analysis

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sentiment: weak positive

positive

negative

Obama is ok

Obama is great

Obama is terrible

Linguistic analysis

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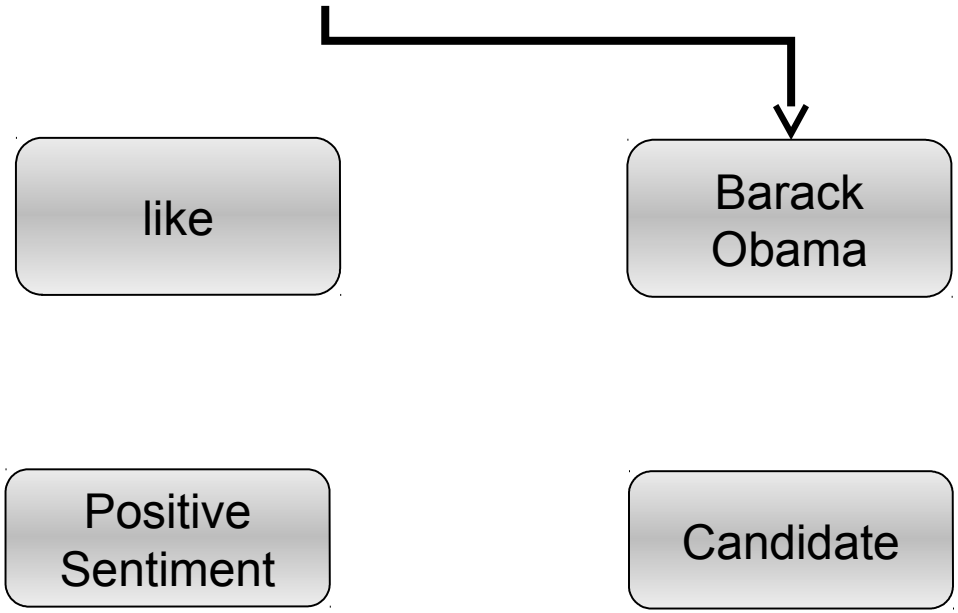
- Example:

I really **like** **Obama**. He seems like somebody that I can trust.



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3.) Modeling

Modeling

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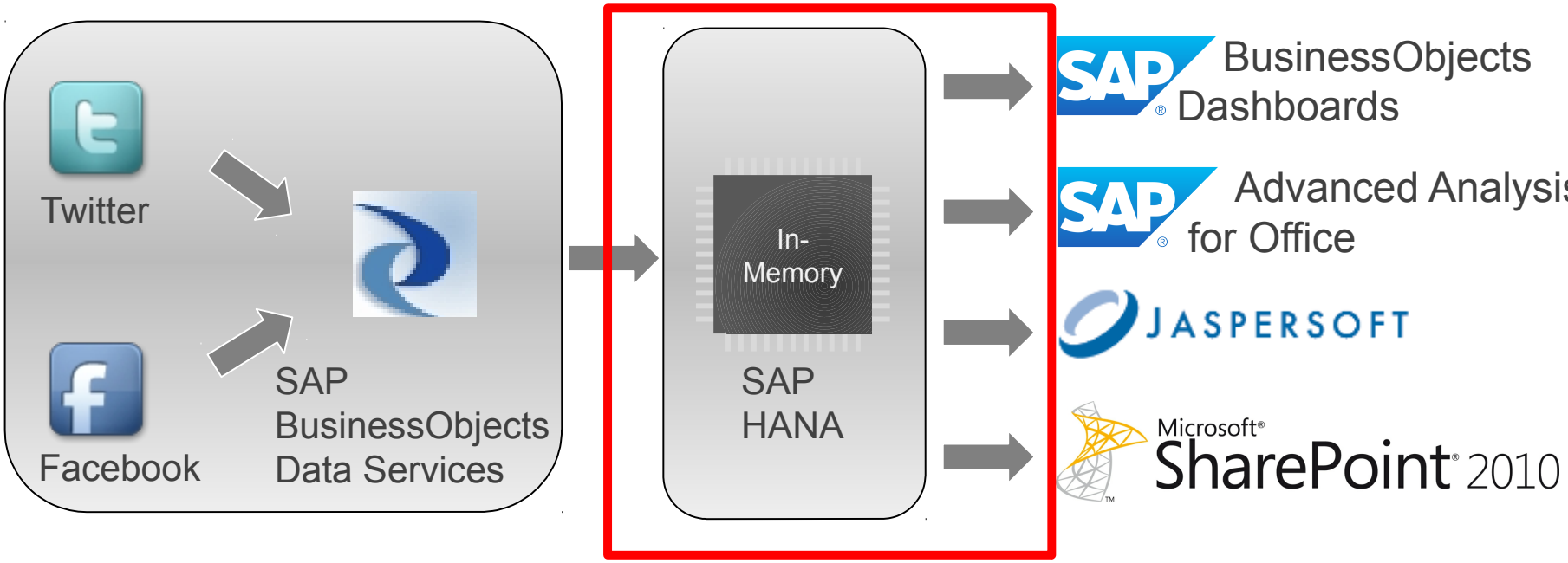

1.) Extract 2.) Sentiment Analysis 3.) Modeling 4.) Analysis

Modeling in SAP HANA Studio

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- Attribute Views
  - give master data tables context
  - subset of columns and rows from a data table
- Analytic Views
  - build data foundation based on transactional tables
  - contain normal attributes and measures
  - measures are aggregated key figures
- Calculation Views
  - provide composites of other views
  - join or union two or more analytic views or tables

Modeling Tasks

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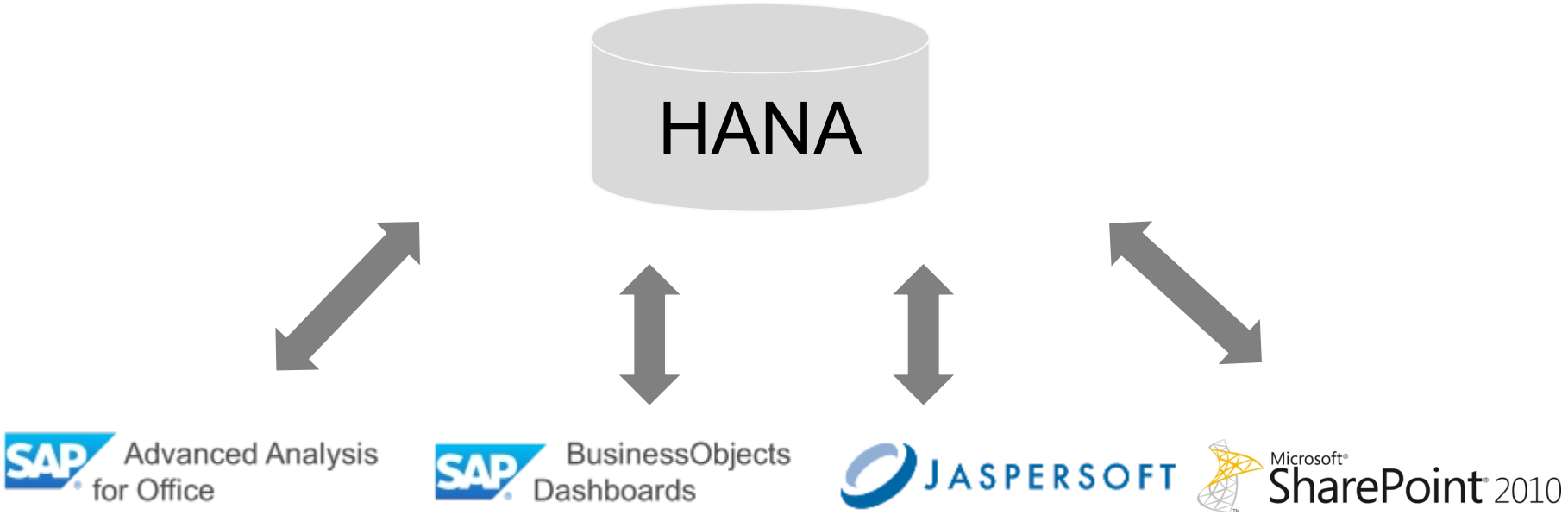

- Create different SAP HANA Views for different purposes
  - provide fast data access for frontend tools
  - aggregate information
  - filter ambiguous sentiments within post content

Modeling Example

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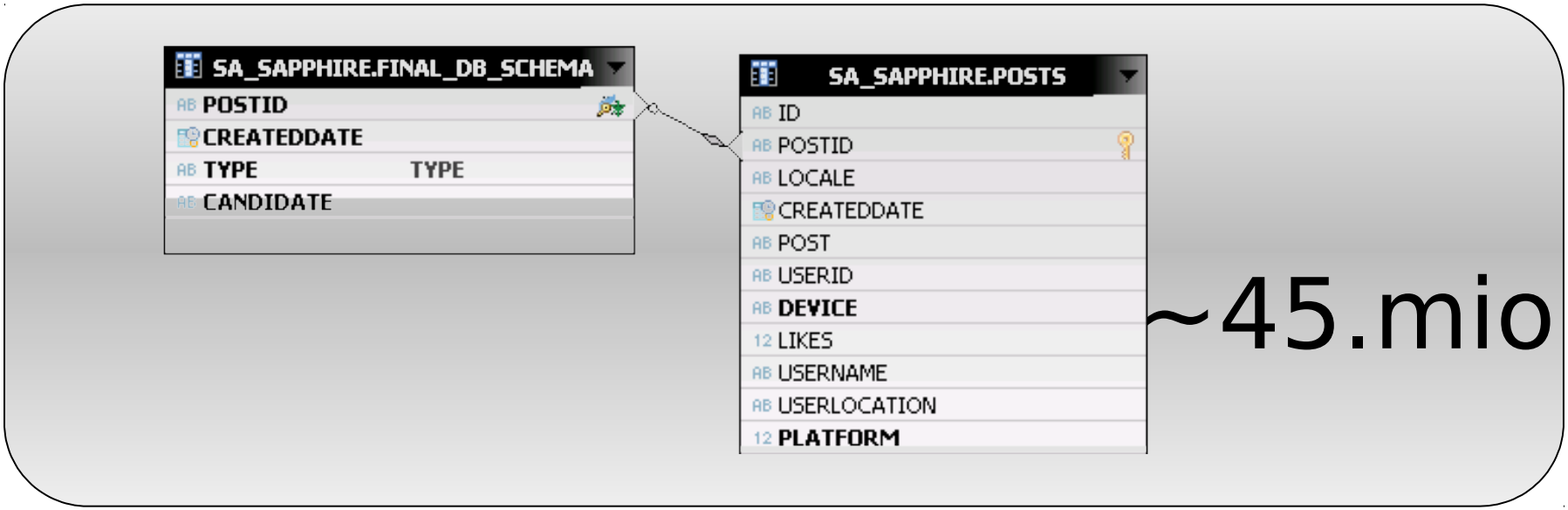

500ms

DEVICE	CANDIDATE	TYPE	POSTID_COUNT
Twitter for iPhone	barack hussein obama	Negative Sentiment	164609
		Positive Sentiment	199723
	mitt romney	Negative Sentiment	304028
		Positive Sentiment	170314

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The Project
4.) Analysis

Interfaces frontend tools – SAP HANA

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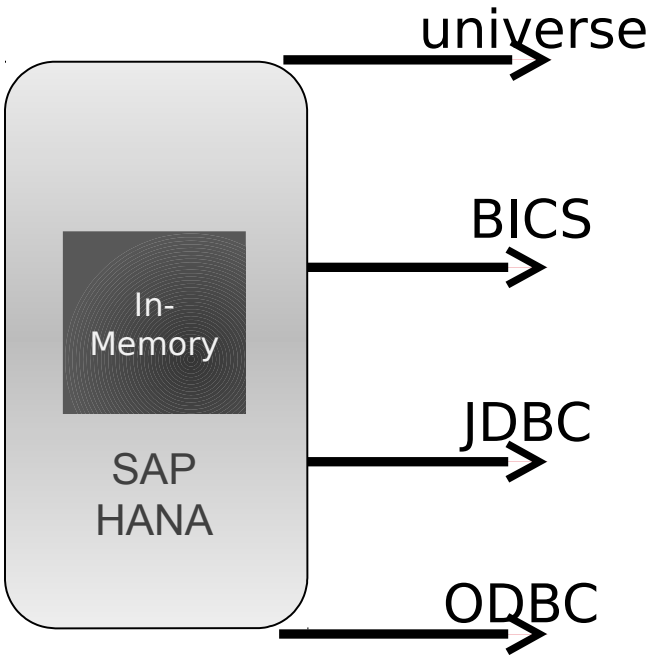

SAP BusinessObjects Dashboards

SAP Advanced Analysis for Office

JASPERSOFT

Microsoft® SharePoint® 2010

Dashboards: Start View

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SAP BusinessObjects Dashboards

Dashboards: overview

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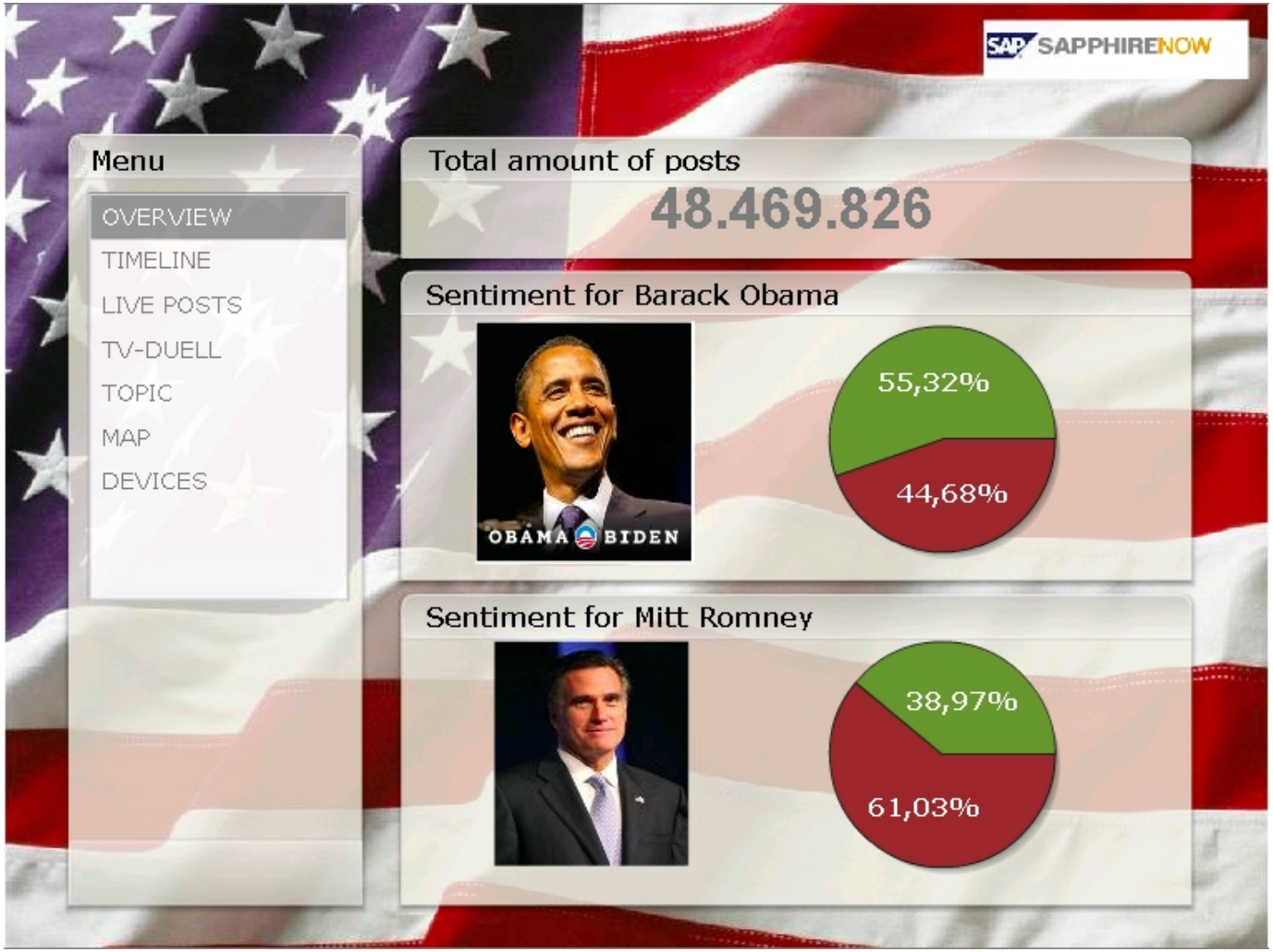

SAP BusinessObjects Dashboards

Dashboards: Time Line

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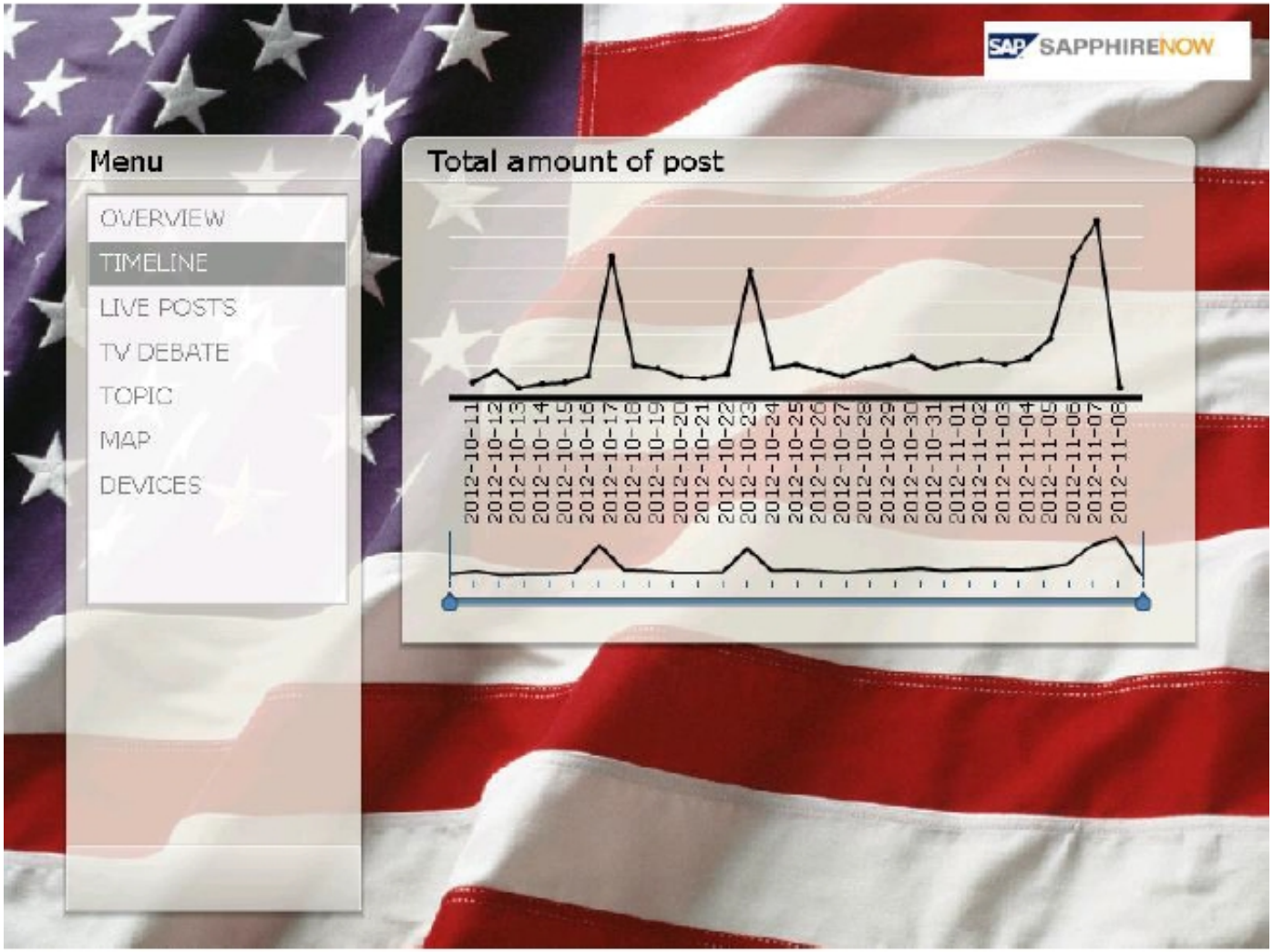

SAP BusinessObjects Dashboards

Dashboards: Live Posts

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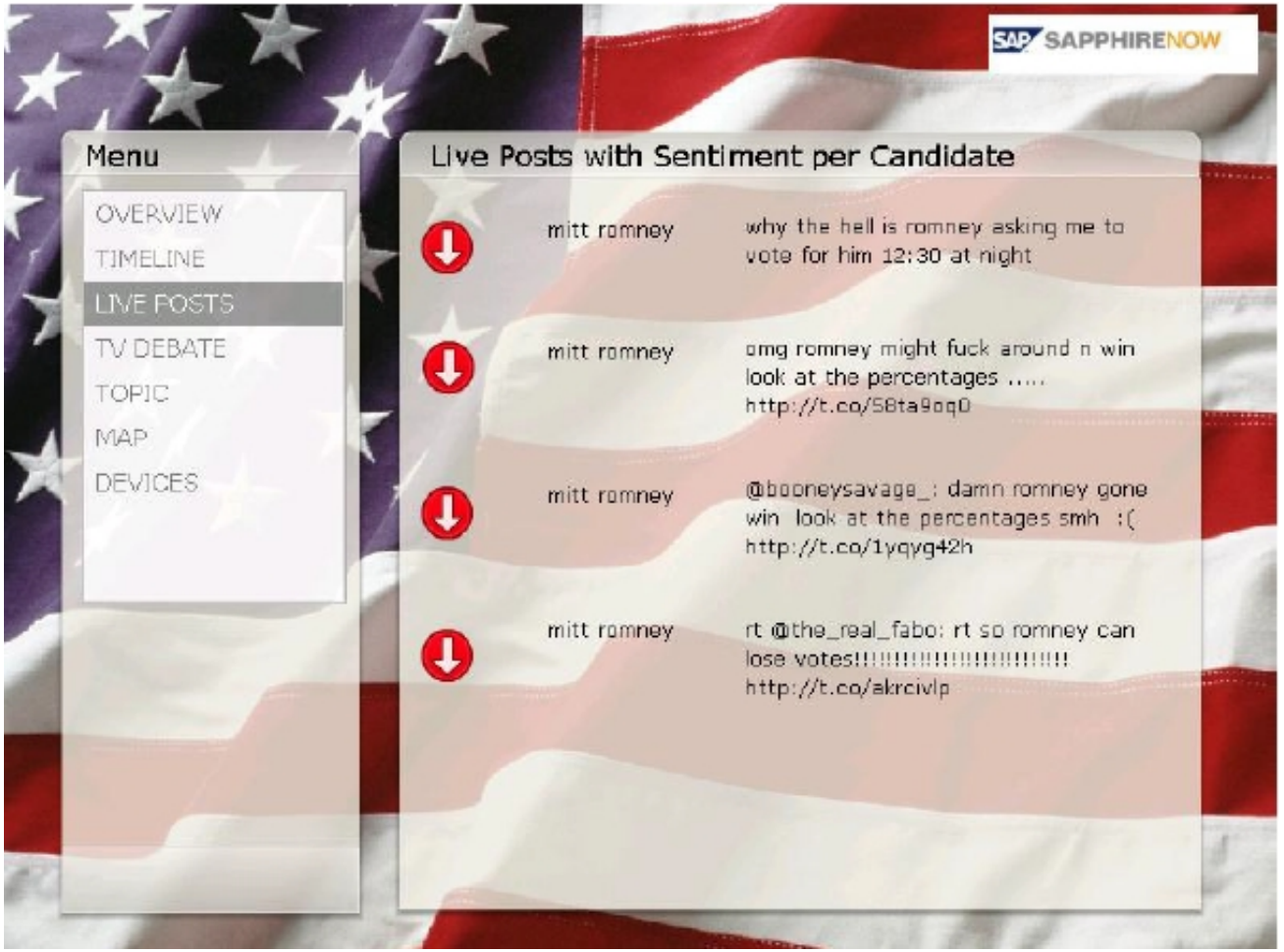

SAP BusinessObjects Dashboards

Dashboards: TV Debate

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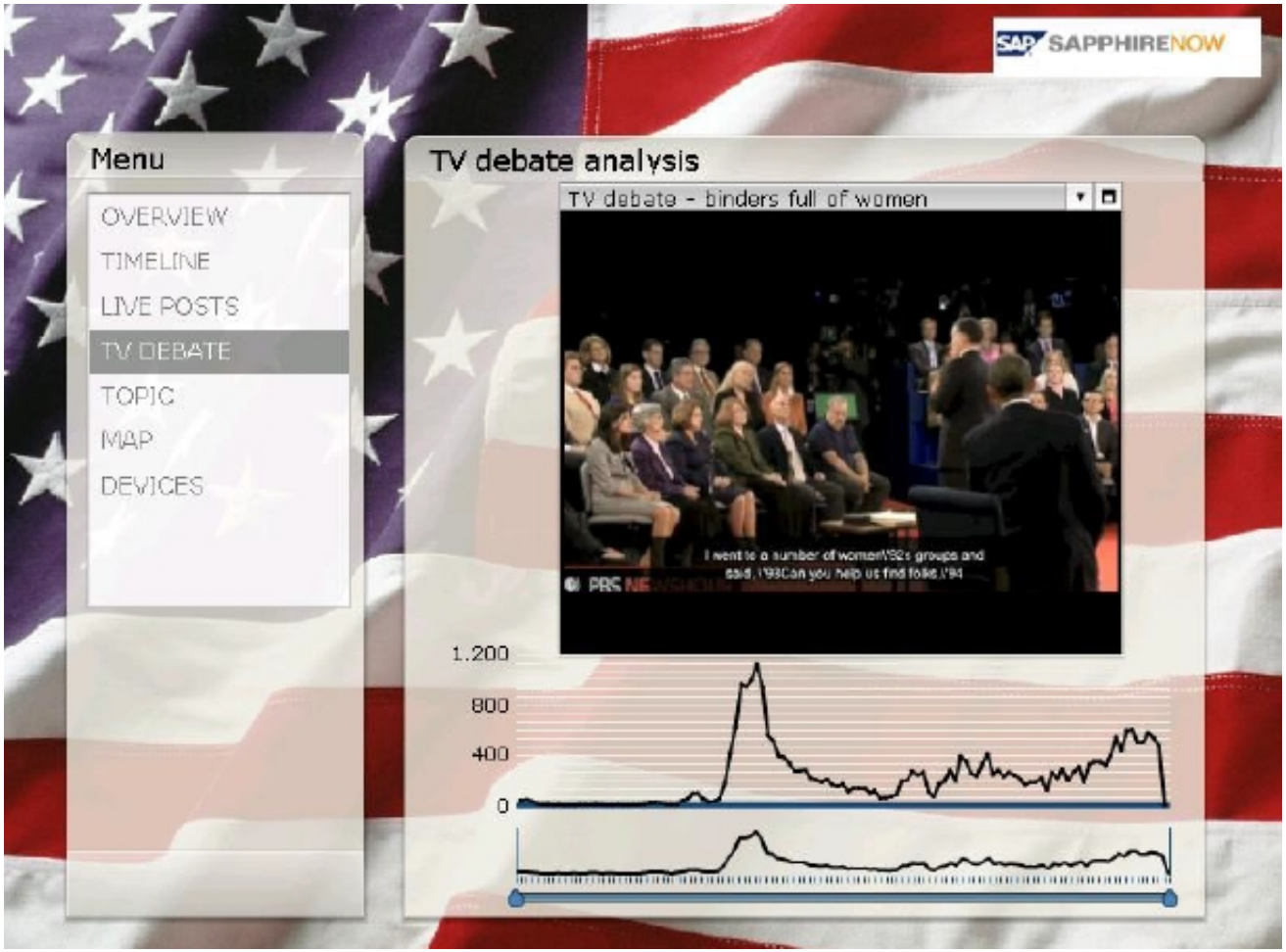

SAP BusinessObjects Dashboards

Dashboards: topics

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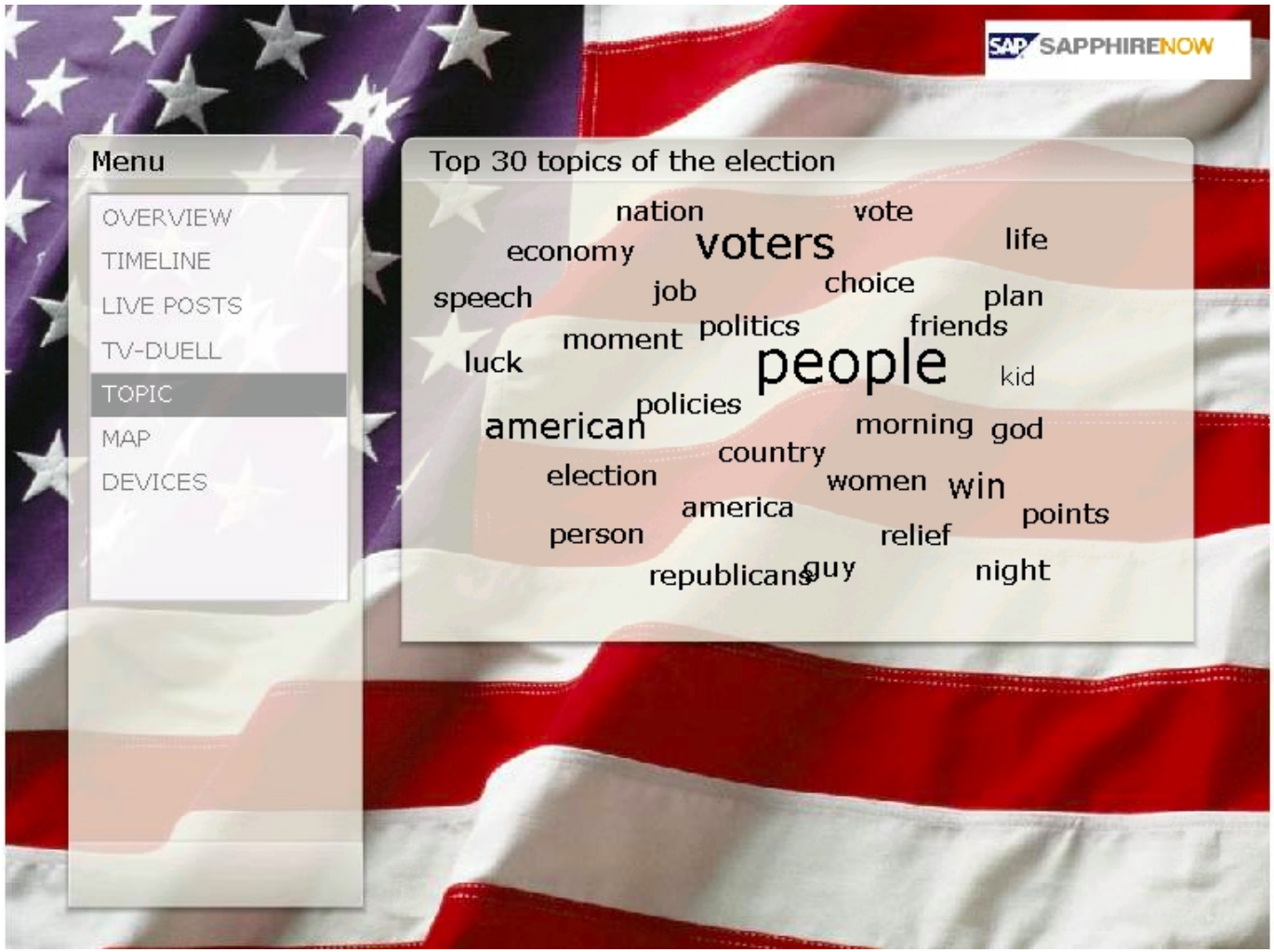

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Dashboards: geographical distribution

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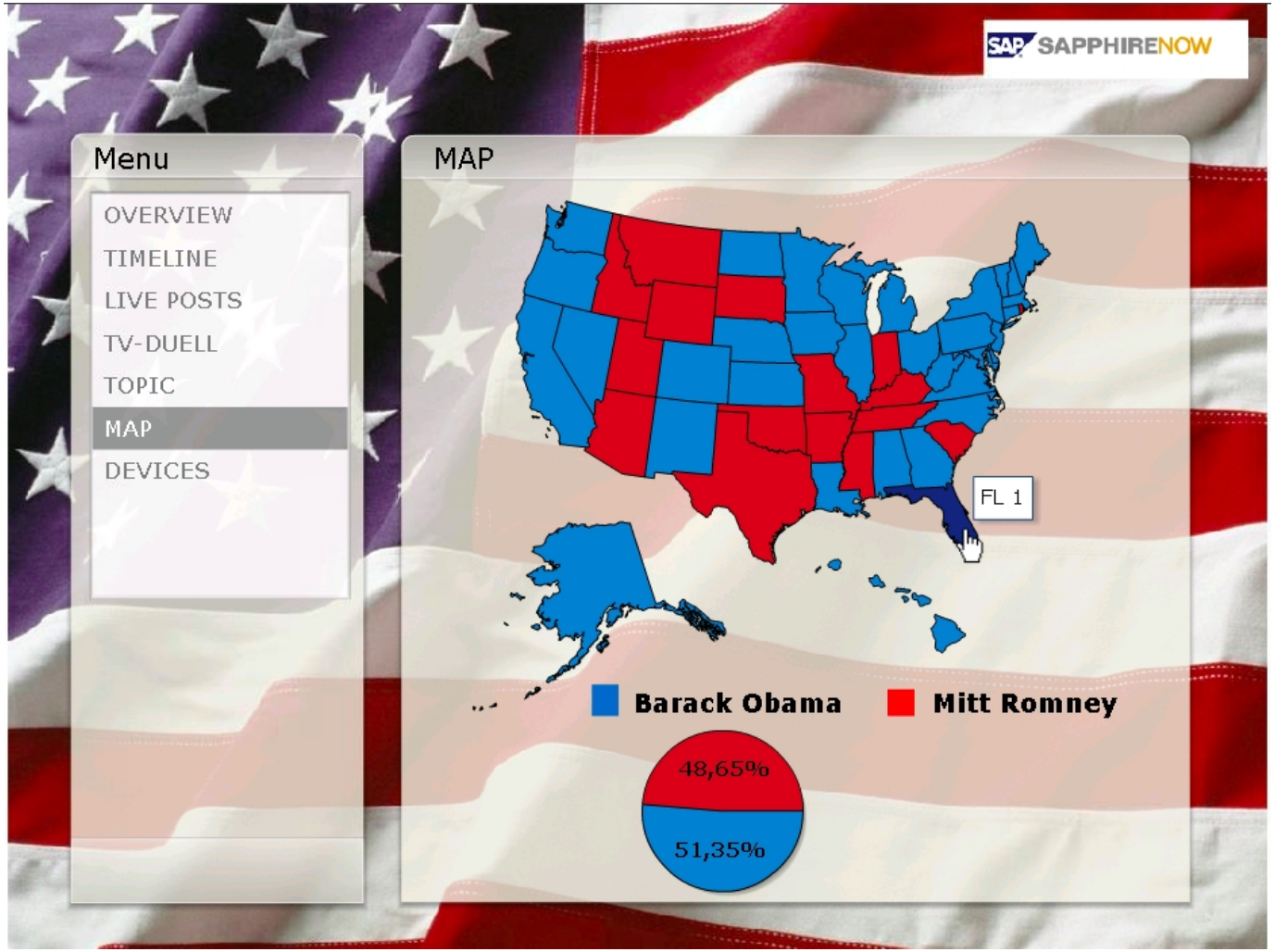

SAP BusinessObjects Dashboards

Dashboards: devices

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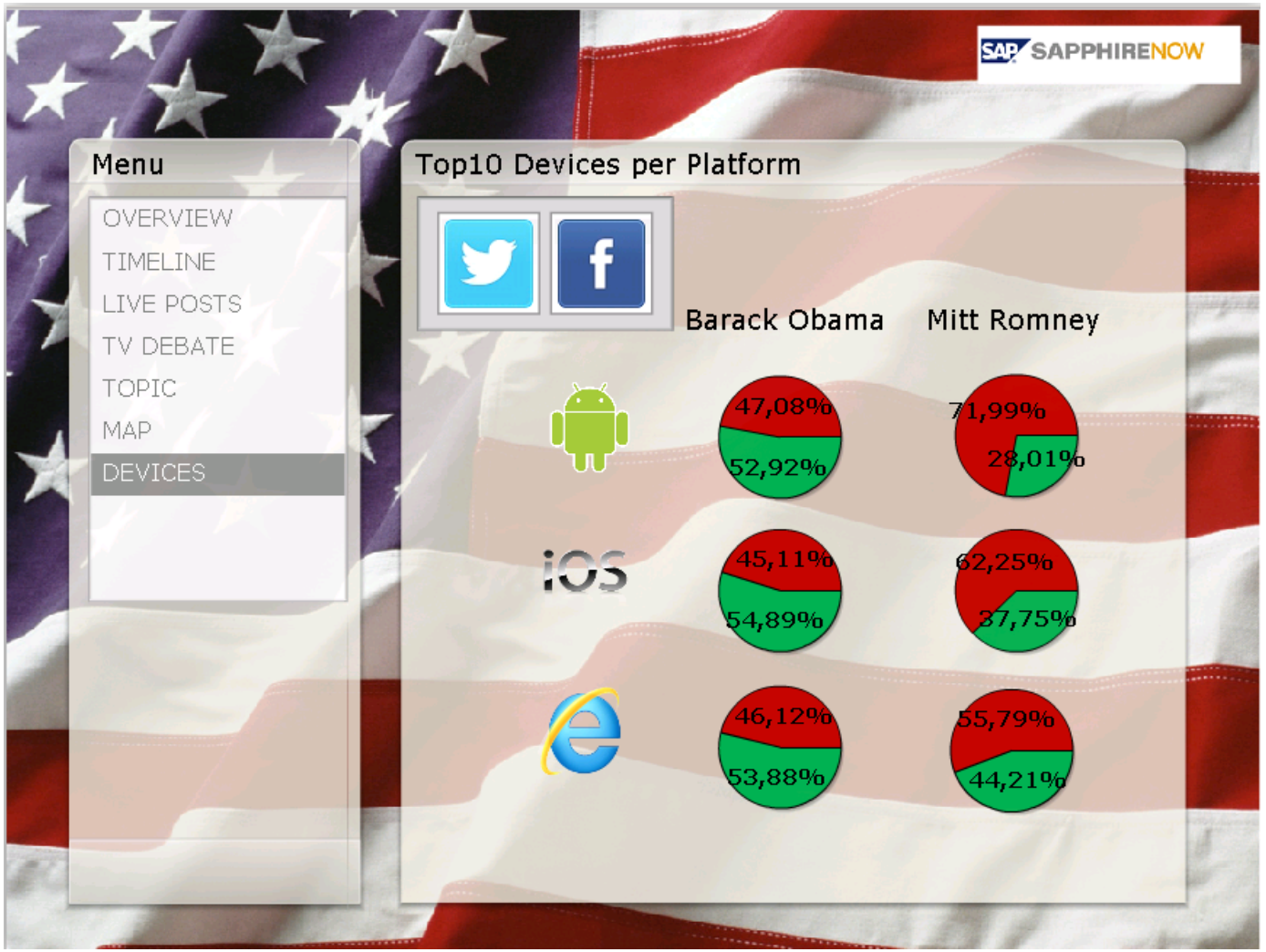

SAP BusinessObjects Dashboards

Project resumé

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- great experience in a interesting real life example
- exceptional opportunity to work with the innovative In-Memory DB SAP HANA and SAP BusinessObjects tools
- result and performance of developed set-up is above all expectations