Research Reporting and Visualization

Jean-Christophe Pazzaglia & Keith Harmon, SAP HERUG, April 2016
All is about creating the perfect conditions to boost Creativity of researchers!
Motivation

Problem
Knowing current and future research trends
Overview of existing project and opportunities
Get the information needed to take a decision

Solution
Digital first
Proper Data sanitization
Complete/Uptodate information
Fast Access & Results
Sexy GUI

Unfair advantage
Big & Fast Data
Complete oversight of research performance
Benchmarking platform
Predefined (albeit customizable) KPIs attached to solutions
Share experience across customers
Influence donors to use STANDARD best practices

Unique Value Proposition
Have the answer before you know the questions

Key Activity
Capture experience & reuse
Quantitative & Qualitative KPIs
Set of pertinent KPIs

Customer Segment
Top management of universities
High profile Research Managers

Channels
Creating jealously between institutions
Testimonials by users
Bad news!

1 - Pick a persona
2 - Take a bunch of post-it of the persona's color
2 - Write all that come to your mind on How BI/Dashboards/Predictive analytics can help her?

Please use one post-it per idea!
How BI/Dashboards/Predictive analytics can help her?
Two teams, two stories!

“I’ll be back!”
Do I sound like Terminator?
Motivations

• BI Dashboards based on Xcelsius
• Forecasting in projects and finance
• Standalone data model
• Ad-Hoc KPIs

Today

Remaining Challenges

• 360 Vision
  • Research effectiveness
  • Reputation
• Support for open data model
  • CERIF
  • SnowBall Metrics
• Role of predictive Analytics

Prototype

• Extend the scope to research and decision support
• Cerif based Data Model
• KPI Based on SnowBall Metrics
• Integrate external data sources

Prototype
Using Data to Understand and Pilot your Research

360 degrees analyze of the institute

- **Recruitment**
  - To predict recruitment needs based on current and future effort

- **Proposals**
  - To predict number/amount of proposals to run/grow the institute

- **Projects**
  - To understand Overall Situation for HR and budget based on start and ending dates of ongoing and upcoming projects

- **Research**
  - To analyse publication and reputation
  - To optimize patent production

- **Strategy**
  - To create *what if* scenarios for the worst case and the best case based on acceptance or rejection of submitted proposals
CERIF Based Data Model

- CERIF is a **global data standard** for managing and exchanging data such as information about researchers, organizations, projects, outputs and funding.

- It provides a **data model** that can be used to describe the research domain, including relationships between the constituent parts, and how this changes over time.
How to use the CERIF Model for KPIs

Metrics through Measures & Indicators

- increased turnover *by 1.2M€ in 2012*
- time savings *of 14.56%*
- reduced costs *by 42%*

Example of a Metric Representation in CERIF: Total amount of project funding awarded

**OrgUnit:** Department of EIT

**Indicator:** Total amount of project funding awarded

**Measurement:** 500000 EUR

**Indicator Value:** 2012-01-01 – 2012-12-31
KPIs Based on Snowball Metrics

Example of a CERIFied Citation Count Metric

**OrgUnit:** Department of EIT

**Indicator:** Citation count
- **Measurement:** 259
- **Period:** 2015-01-01 – 2014-09-25

**RSS / OpenAIRE Lumira Data Extension**

2015-09-25 (when measured)
Foreseen Technical Architecture

Client database, flat files...

External information

Data Services 4.2

DTD of required Certified Complete Model

Combination of Query transform

Certified Data

Parsing Dictionary tool

+ CERIF Model (allowed vocabulary matching with Cfenities)

Loading of Data into HANA

SAP LUMIRA SERVER ON SAP HANA

VizPacker
JavaScript Extension

SAP LUMIRA DESKTOP
(Offline Mode)

SnowBall Metrics

Smart Analytics
Scope of the Prototype

- Client database, flat files...
- External information
- Data Services 4.2
- DTD of required Certified Complete Model
- Combination of Query transform
- Certified Data
- CERIF Model (allowed vocabulary matching with Cenities)
- Parsing Dictionary tool

VizPacker JavaScript Extension
SAP LUMIRA SERVER ON SAP HANA
SAP LUMIRA DESKTOP (Offline Mode)
SnowBall Metrics
Smart Analytics
Conclusion

• **Higher Education and Research peculiarities:**
  • Financial gain is not the main KPIs
  • Project based funding with low selection rate (<20%)
  • Efficiency based on IPR (eg. publications, patent portfolio, spin-off)

• **This PoC is centered around those specificities**
  • Adopt sector initiatives in terms of global data standards and metrics (eg. CERIF, Snowball)
  • Different country wide initiatives to assess research ‘excellence’ (eg. Scandinavia, UK, Italy, Netherland, Germany…)
  • Accurate analytics and prediction for different key stakeholders
Using JAM to manage Collaborative Research Projects - The Setup (1/2)
Using JAM to manage Collaborative Research Projects - Using JAM Widgets (2/2)
Leverage Researchers and Students Creativity with Innovation Management
Is Management by Objectives a good practice for Research?
Toward a new Research Information System - Setup (1/4)
Toward a new Research Information System - Personas (2/4)
Toward a new Research Information System - The Erika case (3/4)
Toward a new Research Information System - The Heinz case (4/4)
Using Lumira and domain specific KPIs to understand and pilot research institutions

“Thank you & the 7000 readers”
Keih & JC
Further Examples
Example : HR Forecast for ACCENTIVA project

- 1.75 FTE needed for 2015
- 5.83 FTE needed for 2016

Baseline for the discussion between PM and Head of Department

All numbers computed with SAP forecasting functions.

- 138 PM available as cumulative effort for 2015
- Committed effort of 159 PM by end 2015
- Committed effort of 239 PM by end 2016
Example: Spending State By Department

<table>
<thead>
<tr>
<th>Department</th>
<th>Budget Spending Forecast (linear)</th>
<th>Current Budget Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture and Forestry 2015</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energy, Environment and Climate 2015</td>
<td></td>
<td></td>
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<tr>
<td>Engineering and Information Technologies 2015</td>
<td></td>
<td></td>
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<tr>
<td>Humanities and Social Sciences 2015</td>
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<tr>
<td>Mathematical, Physical and Life Sciences 2015</td>
<td></td>
<td></td>
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<tr>
<td>Medical and Health Sciences 2015</td>
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</tr>
</tbody>
</table>

Department with critical budget consumption (> 130%)
Example: Funding Tracking

Budget granted by Funding Program for all department ongoing projects

Cost of Generated Scholarly Output
(Calculated using FTE made available for output generation, administrative costs...)

Percentage of Funding allocated for output generation
Example: From Ideas to Patent in the A&F Department

- **Internal selection fit to fill patent request (60%)**
- **External selection fit (80%)**
- **Researcher Incentives**
- **Large Investment (patent attorney)**

IDF 2009 Acceptance rate in 2013
Example: Portfolio Analysis (Budget size and consumption, research phases)

Spending rate by department according to time phase

- Over Budget!
- Budget Shortage!
Example: Proposals Forecasting

- **Ongoing Projects**

- **2014 AVG New Projects & Foreseen projects**

- **Year / Quarter**
  - 2013: 1, 2, 3, 4
  - 2014: 1, 2
  - 2015: 1, 2, 3, 4
  - 2016: 1, 2, 3, 4

- **Proposals and projects number evolution between 2013 and 2017**

- **Number of Proposals Submission (2nd Semester of 2013)**: 14
- **Number of new project (1st Semester of 2014)**: 8
- **Number of Proposals submitted (1st Semester of 2015)**: 15
- **Foreseen opening projects according to previous Success Rate**: 8
- **Proposals to be submitted in the institute during first semester of 2016 (due to end of several projects)**: 24

- **Success Rate of 0.54**

- **14 desired opening projects to keep 2015 number of ongoing projects**
Example: Proposals Forecasting (In a nutshell)

Keeping the same number of proposals and new projects opening between 2014 and 2015, we couldn’t overcome the reduction by third of ongoing projects.

We should increase by third our proposals submission in 2016 to hope to keep at least 2015 number of ongoing projects (considering similar success rate).
Thank you

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