SceMaps.eu: Data Analytics Platform Overview

29.04.2021   **Martin Tsanov**

Major Objectives/Challenges

➤ Finding the most efficient ways to utilize publicly available data, in order to increase transparency

➤ Monitoring occurrences of suspicious behavior related to state capture and corruption in public procurement such as:

- ❖ Companies winning tenders shortly after incorporation
- ❖ Companies dependent exclusively on public procurement funds
- ❖ Suspicious buyer-supplier links
- ❖ Favoritism by certain political forces
- ❖ Rent-seeking behavior
- ❖ Discriminating selection criteria

➤ Approaching the issue of detection suspicious behavior in public procurement from a multi-angle perspective

➤ Scalability in an EU-wide context

Project Scope

➢ Piloted in 4 countries:

❖ Bulgaria
❖ Spain
❖ Romania
❖ Italy

➢ Monitors data from 3 high-corruption risk sectors in the 2010-2019 period:

❖ Construction
❖ Wholesale of fuels
❖ Wholesale of pharmaceuticals and medical equipment

Available Resources

➢ Open public data:

- ❖ Public procurement data (public procurement registries)
- ❖ Corporate data (trade registries) (with lmited usage of paid access to corprate data vendors)
- ❖ Media data
- ❖ Government terms data

➢ Big data processing (collection/aggregation/analytics)

- ❖ Named-entity recognition (unique identification and aggregation)
- ❖ Multi-step matching process
  - • Per company
  - • Per contracting entity
- ❖ Machine learning algorithms based on training sets (groupings of keyword dictionaries)
- ❖ Sentiment analysis/neural networks

Results

- ➤ Ranking
  - ❖ Awarded companies (5 filter options)
  - ❖ Contracting entities (3 filter options)

- ➤ Profiling
  - ❖ Buyer profile (Project History and Institutional Profile)
  - ❖ Supplier profile (Project History and Company Profile)

- ➤ **Red Flagging**: 17 Red Flags
  - ❖ Awarded companies (14 flags)
  - ❖ Contracting entities (3 flags)

- ➤ Market Sizing – interactive macro market analytics
  - ❖ Single unit metrics (companies, institutions, number of tenders, EUR amount)
  - ❖ Ratio metrics (showing competiveness of market /EUR per supplier/, average contract size, procurement market as part of overall sector)
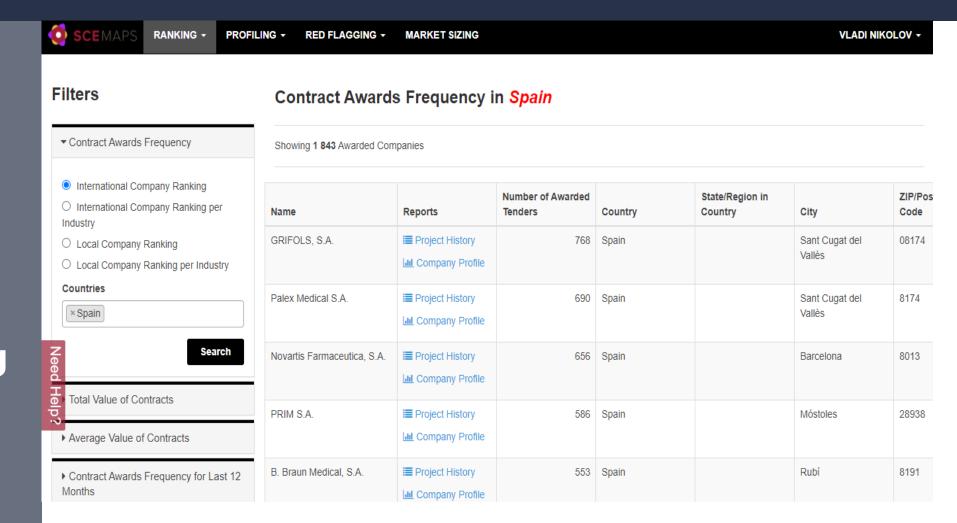
Ranking

➢ Available for both **Awarded Companies** and **Contracting Entities** by:

- ❖ Contract awards frequency

- ❖ Size of contract awards (EUR)

- ❖ Average value of contracts (EUR)

- ❖ Recent success in the last 12 months as compared to the company's historical performance (*only for awarded companies*)

➢ Granular analysis available on **sectoral** and **local** (by country or city/town) **level**

Contract Awards Frequency: Company Ranking by Country

Profiling

➢ Interactive analytics, which combines public procurement and external data (from business databases and media outlets) with "red flags" indicators

➢ Visualzies the assessment of the risks of state capture and corruption within particular contracting entities and awarded companies

➢ Parent-child corporate relationships (classification the companies either as parent/child recipients)

➢ Information about offshore involvement available on company level

➢ Thresholds for search only for parent companies and above certain procurement activity levels

Buyer Profile Data Points

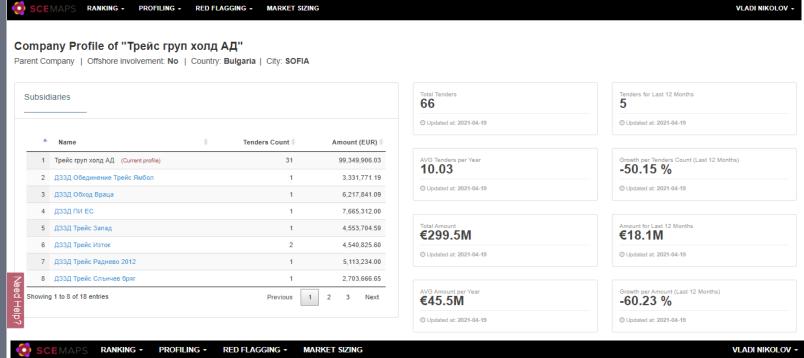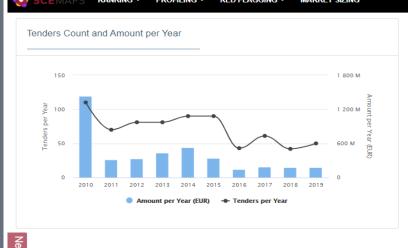|	
Total Contract Awards	Increase of Awarded Amount (Last 12 Months)
Total Awarded Amount	Tenders Count and Amount per Year
Contract Awards for Last 12 Months	Contract Awards per Industry
Awarded Amount for Last 12 Months	Awarded Amount per Industry
AVG Contract Awards per Year	Contract Awards per Year and Industry
AVG Awarded Amount per Year	Contract Awards per Tender Location
Increase of Contract Awards (Last 12 Months)	Supplier Concentration Index

Supplier Profile Data Points

Total Tenders	Subsidiaries (if any)
Tenders for Last 12 Months	Tenders Count and Amount per Year
AVG Tenders per Year	Government Terms
Growth per Tenders Count (Last 12 Months)	Tenders per Industry
Total Amount	Amount per Industry
Amount for Last 12 Months	Contracts per Year and Industry
AVG Amount per Year	Contracts per Tender Location
Growth per Amount (Last 12 Months)	Contracting Entity Concentration Index

Supplier Profile Example

➢ Total and average tenders won
➢ Total and average awarded amount
➢ Subsidiaries
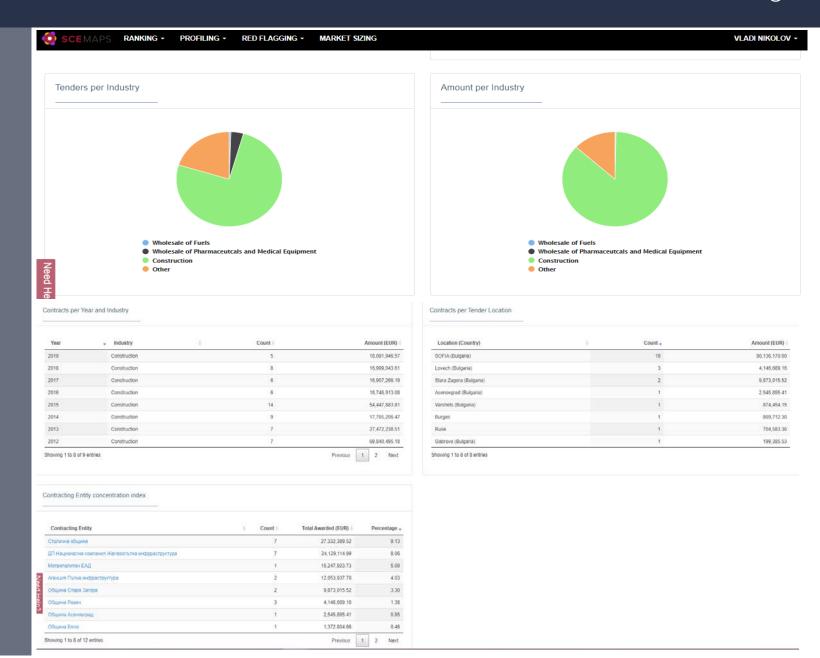➢ Tenders count and awarded amount per industry
➢ Government terms volatility

Supplier Profile Example (continued)

➢ Tenders count and amount per year and industry
➢ Contracts per tender location
➢ Buyer Concentration index

Red Flagging

Main Groups

➤ Most Notable Recent Success

- ❖ Per Tender Count
- ❖ Per Value of Contract
- ❖ Per Contracting Entity
- ❖ Per Tender Location

➤ High Exposure to Procurement

- ❖ Procurement exposure ratio by revenue
- ❖ Procurement exposure ratio by net income
- ❖ Procurement exposure ratio by total assets
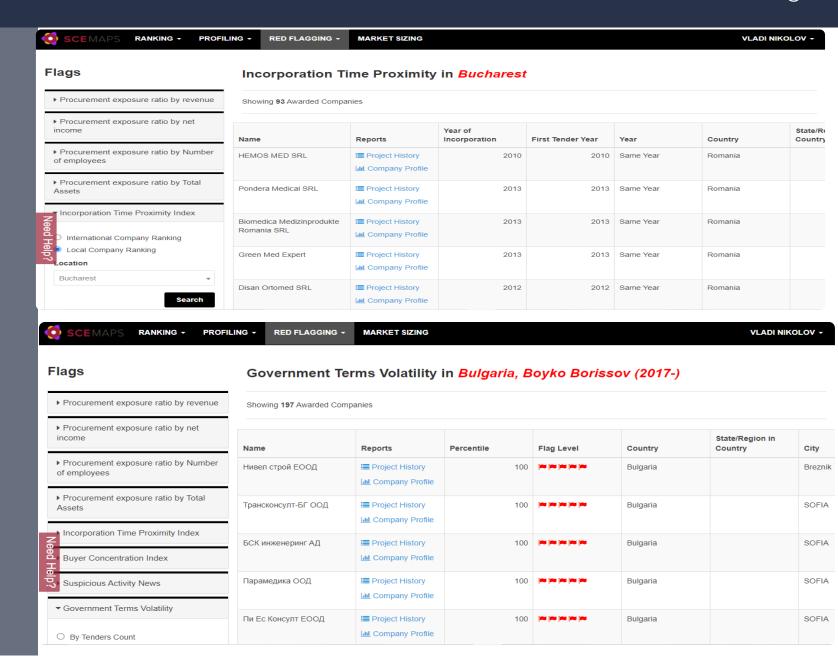- ❖ Procurement exposure ratio by number of employees

➤ Concentration Levels

- ❖ Buyer Concentration
- ❖ Supplier Concentration

➤ Other

- ❖ Incorporation Time Proximity Index
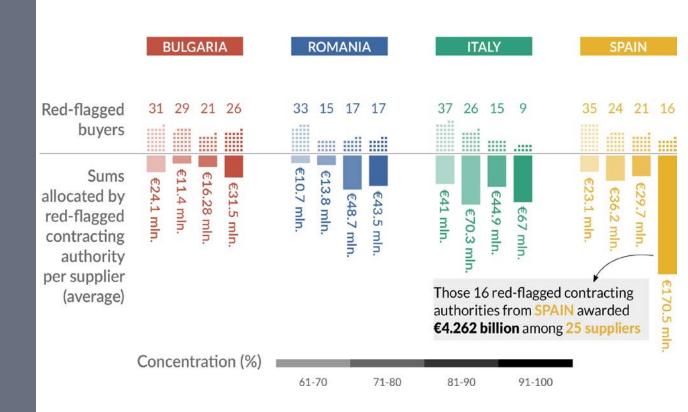- ❖ Suspicious Activity News
- ❖ Government Terms Volatility

Red Flags Examples

➤ Incorporation Time Proximity
➤ Government Terms Volatility

Red-flagged Contracting Authorities by Buyer Concentration Index

	BULGARIA	ROMANIA	ITALY	SPAIN
Red-flagged buyers	31 29 21 26	33 15 17 17	37 26 15 9	35 24 21 16

Sums allocated by red-flagged contracting authority per supplier (average)

BULGARIA: €24.1 mln. €11.4 mln. €16.28 mln. €31.5 mln.

ROMANIA: €10.7 mln. €13.8 mln. €48.7 mln. €43.5 mln.

ITALY: €41 mln. €70.3 mln. €44.9 mln. €67 mln.

SPAIN: €23.1 mln. €36.2 mln. €29.7 mln. €170.5 mln.

Those 16 red-flagged contracting authorities from SPAIN awarded **€4.262 billion** among **25 suppliers**

Concentration (%)

61-70   71-80   81-90   91-100

Market Sizing

➢ Diverse macro comparison analytical options, thus providing comparative insights into:

  ❖ The size and competitiveness of the procurement market
  ❖ The number of tenders, suppliers and buyers on a various timeline basis
  ❖ A comparison between countries and industries

➢ Filtered by:

  ❖ Time range
  ❖ Geography
  ❖ Industry
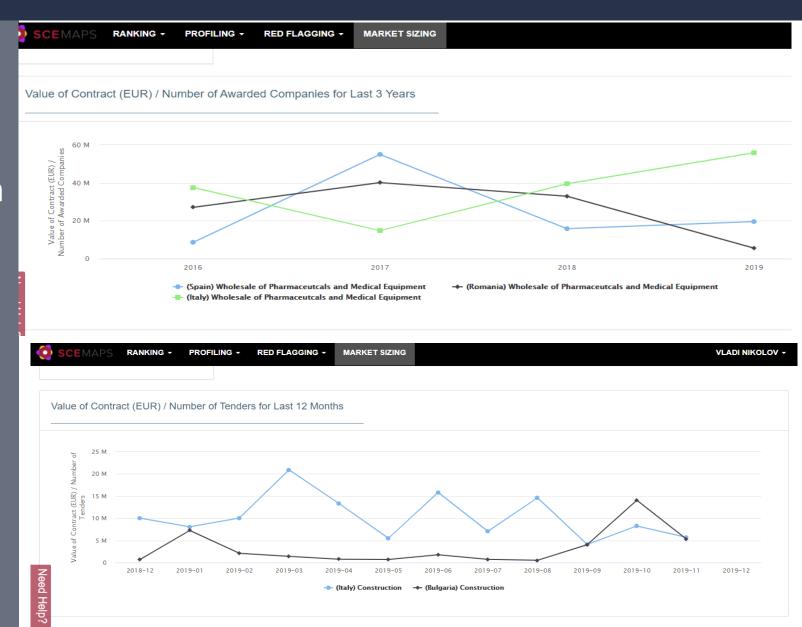
Market Sizing Metrics

Single Metrics	Ratio Metrics
Number of Tenders	Value of Contract (EUR) / Number of Tenders
Value of Contract (EUR)	Number of Tenders / Number of Awarded Companies
Number of Awarded Companies	Number of Tenders / Number of Contracting Entities
Number of Contracting Entities	Value of Contract (EUR) / Number of Awarded Companies
	Value of Contract (EUR) / Number of Contracting Entities
	Procurement as a % of Sector Turnover

Market Sizing: Results from the Application of Filters

➢ Ratio metrics application

❖ Value of contract / Number of awarded companies
❖ Value of contract / Number of tenders

Value of Contract (EUR) / Number of Awarded Companies for Last 3 Years

- (Spain) Wholesale of Pharmaceutcals and Medical Equipment
- (Italy) Wholesale of Pharmaceutcals and Medical Equipment
- (Romania) Wholesale of Pharmaceutcals and Medical Equipment

Value of Contract (EUR) / Number of Tenders for Last 12 Months

- (Italy) Construction
- (Bulgaria) Construction

Platform Features Showing Best Empirical Results

➤ Definitely scalabe to all EEA members and in real time

➤ Red flags

  ❖ Buyer Concentration Index
  ❖ Supplier Concentration Index
  ❖ Most Notable Recent Success per Industry
  ❖ Incorporation Time Proximity Index (only limited by existence of consortiums to show even better results)
  ❖ Procurement Exposure Ratio
    • Per Revenue
    • Per Total Assets (mainly for companies in the construction industry)

➤ Macro analysis options (Market Sizing)

  ❖ Level of competitiveness – average EUR received per supplier (awarded company)
  ❖ Level of competitiveness – average EUR awarded by a buyer (conracting entity)
  ❖ Average contract size (amount/nyumber of tenders)
  ❖ Procurement as a % of sector turnover – high-risk when public sector is a high share of the sector turnover

Shortcomings (Work in Progress)

➢ Weak link between news data and the other two branches of data

➢ Tender data often lacking the exact value (in EUR), especially in cases of multiple awardees and consortiums

➢ Access to local tender data inconsistent between EU member states

➢ Insufficient amount of news items related to corruption in public procurement

➢ Multiple approaches to name variations/parent-child company relations undermine the aggregations of exposing suspicious activity

➢ Inability to mainly utilize publicly available data for companies and necessity to access private corporate data publishers products in order to build analytics on company level

➢ Access to national company regsities inconsitent between EU member states

➢ Lag in election terms causes weak match with company and tender analytics to reveal the government's "favorites"

Opportunities for Future Development

➢ Introducing data standards with clarity on the entire pre-award and selection process

❖ Great progress already achieved by the Digiwhist Team (tender criteria red-flagging)
❖ Data scarcity still a problem (Open Contracting Data Standard (/OCDS/)
❖ Tender data remains "noisy"

➢ Full disclosure of bidding data is key (OCDS)

➢ Better company data and more transparency in trade registers (significant disparities between countries)

➢ Clear definitions on parent-child relationships vs. name variations (aggregation vs. granulation of analysis)

➢ Adding sentiment analysis/fake news detector in order to build meaningful red flags using media data

➢ Transparency on indicative market prices - possible connection to real time product prices (real market prices for certain products/services)

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Check out the video introduction to platform:
SCE Maps – YouTube

Thank You!

Martin Tsanov

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