ANALYSIS OF ONLINE JOB VACANCIES AND OCCUPATIONS AND SKILLS IN DEMAND IN NORTH MACEDONIA

Aleksandar Kostadinov

Methodology

- Web scraping in Python: Najdirabota.com.mk;
- More than 6,000 OJV between August 2018-August 2019, more than 800 web pages downloaded;
- 1. position, 2. qualifications, 3. short_description, 4. announceDate, 5. applyDeadline, 6. areas, 7. orgName
- Regex, an example of Regex: ^, [, \t,], +, |, [, \t,], +, $.

The process:

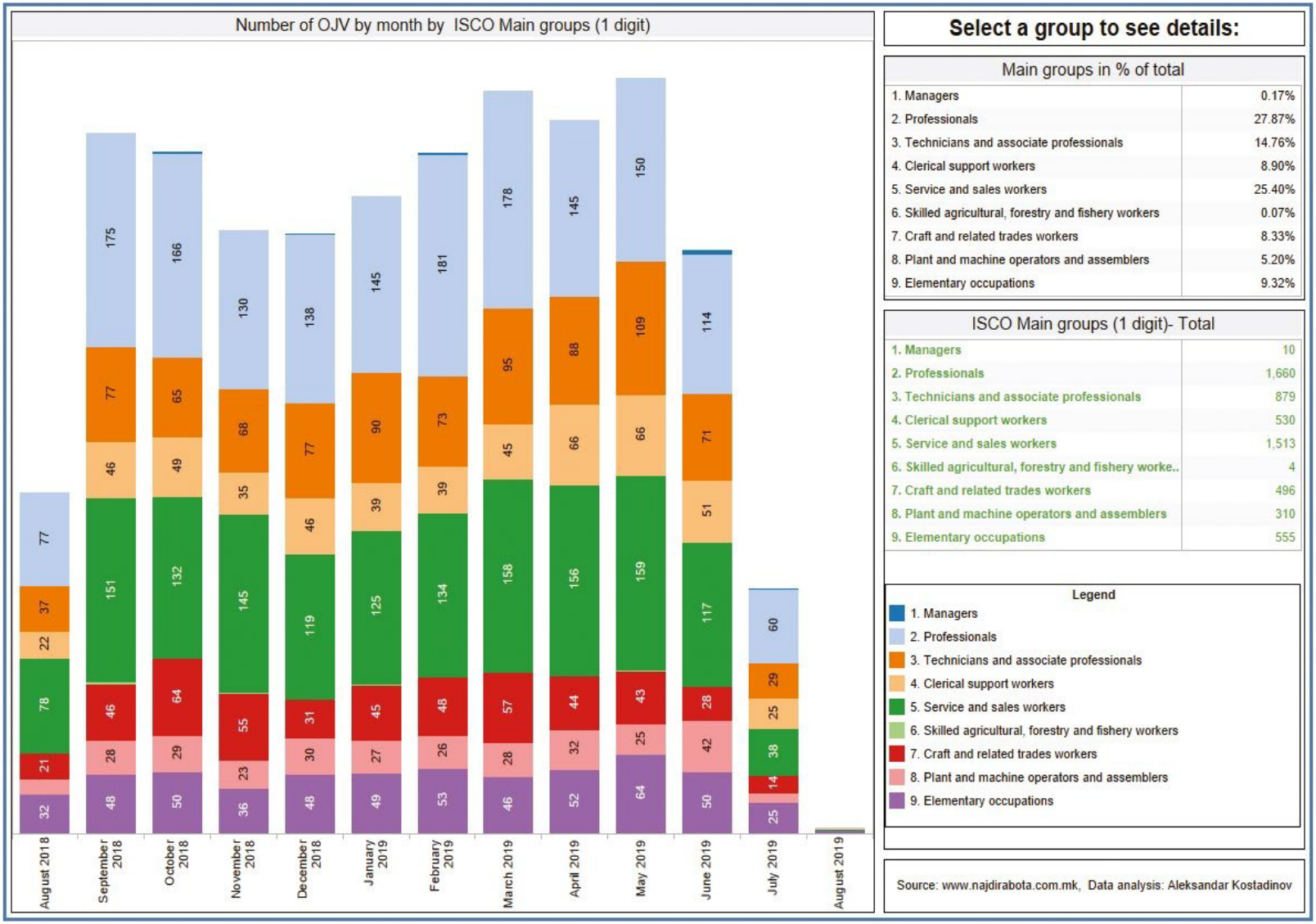
- Once downloaded, the search of occupations field is checked against with the National Occupational Classification (SSO) to 3 level classification;

- The codes in numbers are then compared and matched with the ones from the ENG version.

	A	B	C	D	E	F	G	H
1	position	qualifications	short_description	announceDate	applyDeadline	areas	orgName	SCO
2	Продавач/ка во малопродажен објект		Колонијал Продавница во Ново	17/08/2019	24/08/2019	Скопски	Алка ЦВ	522
3	Магационер		Врз основа на член 22 точка 1 ста	07/08/2019	09/09/2019	Скопски	пост експрес македонија дооел	432
4	Дистрибутер	работно искуство и Б И Ц возач	Компанија за производство и ди	29/07/2019	14/07/2019	Скопски	Центро-Фрута Дооел Виница	962
5	Рецепционер		Ангромаркетинг ДОО има потреб	29/07/2019	15/08/2019	Битолски	Ангромаркетинг ДОО	422
6	Агент за продажба и маркетинг		Младинска книга, реномирана м	24/07/2019	05/08/2019	Цела Македонија	Младинска книга	522
7	Агент за продажба		Компанија за производство и пр	20/07/2019	31/07/2019	Скопски	Моника ДОО	522
8	Информатичар		Заработувајте додека сурфате на	18/07/2019	03/09/2019	Кавадаречки	Работа од дома	251
9	Администратор	Работно искуство	MINEKS GROUP DOOEL SKOPJE Кс	18/07/2019	20/08/2019	Скопски	Минекс Гроуп дооел Скопје	334
10	Референт за продажба		Пет Шоп ТИНА ВЕТ има потреба с	17/07/2019	31/07/2019	Скопски	ТИНА ВЕТ	522
11	Агент за недвижности		За наши интерни потреби барам	16/07/2019	31/07/2019	Скопски	ДОРА ИНВЕСТ	333
12	Работник за обезбедување		Наплаќач на паркинг	15/07/2019	15/08/2019	Скопски	TRANS INTER	541
13	Delphi програмер		Join the world's largest virtual com	13/07/2019	10/08/2019	Цела Македонија	Црјгбр Цјандфхт	251
14	Лимар		Градежна фирна има потреба од	13/07/2019	08/08/2019	Скопски	Орбита Констракшн	721
15	Доставувач		Пица деливери има потреба од л	13/07/2019	27/07/2019	Скопски	Про логистик мах	962

MOST DEMANDED ISCO MAIN OCCUPATIONAL GROUPS	% OF TOTAL (SSO)*	WEB % OF TOTAL**
1. Managers	0.4	0.2
2. Professionals	7.3	27.9
3. Technicians and associate professionals	13.2	14.8
4. Clerical support workers	12.1	8.9
5. Service and sales workers	32.5	25.4
6. Skilled agricultural, forestry and fishery workers	1.2	0.1
7. Craft and related trades workers	7.1	8.3
8. Plant and machine operators, and assemblers	14.6	5.2
9. Elementary occupations	11.5	9.3

Source: * Data from the SSO news release on job vacancies. ** www.najdirabota.com.mk/. Author's calculations.



Source: www.najdirabota.com.mk/. Author's calculations.

Note: The print screen can be seen here: https://public.tableau.com/profile/aleksandarkostadinov#!/vizhome/Tableau_15891784046170/ISCO

Figure 11.7. Dashboard of ISCO 2-digit sub-major occupational groups

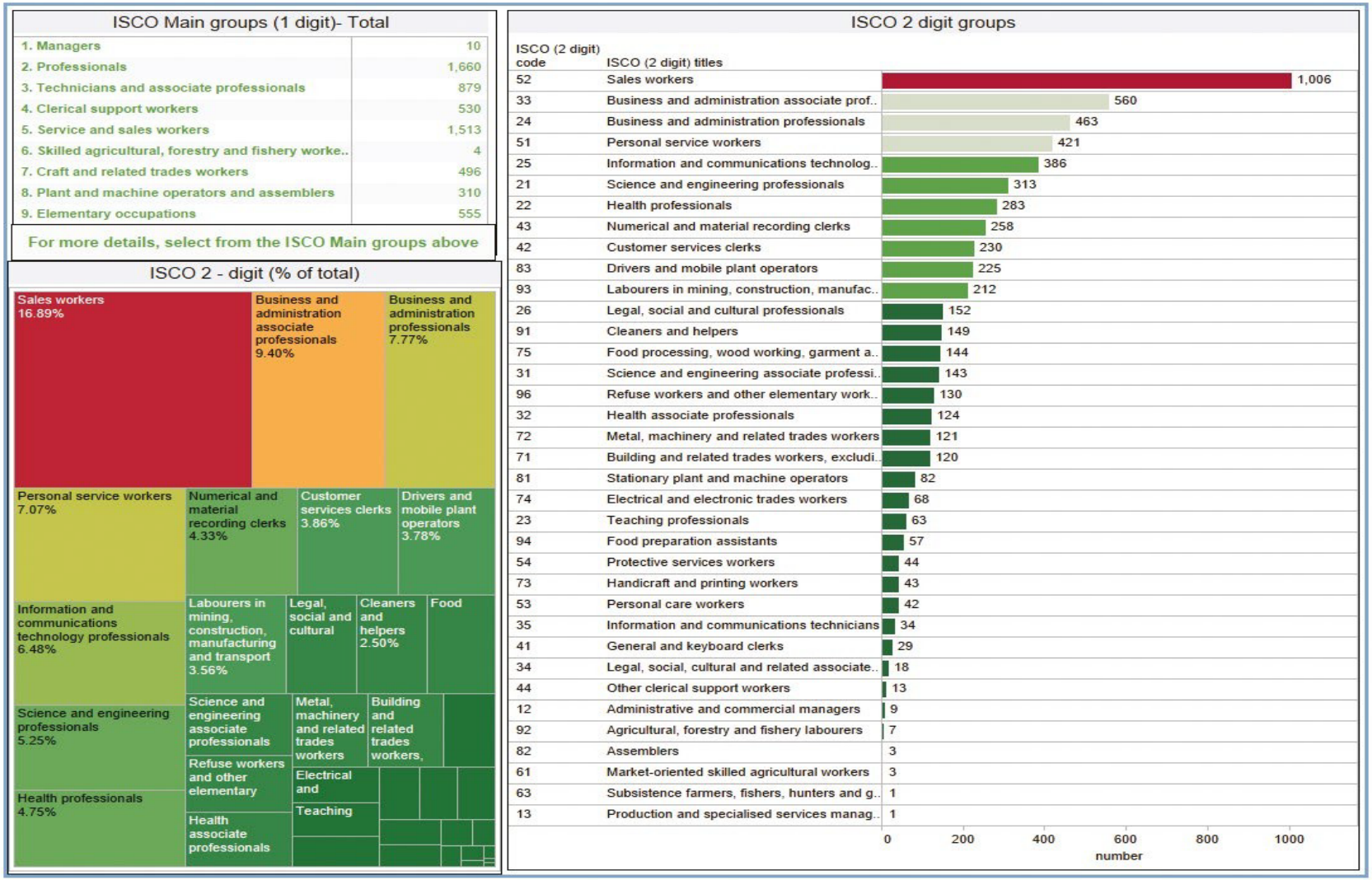


Figure 11.9. Showing ISCO 3-digit occupations by selecting the service and sales workers group in the interactive Tableau tool

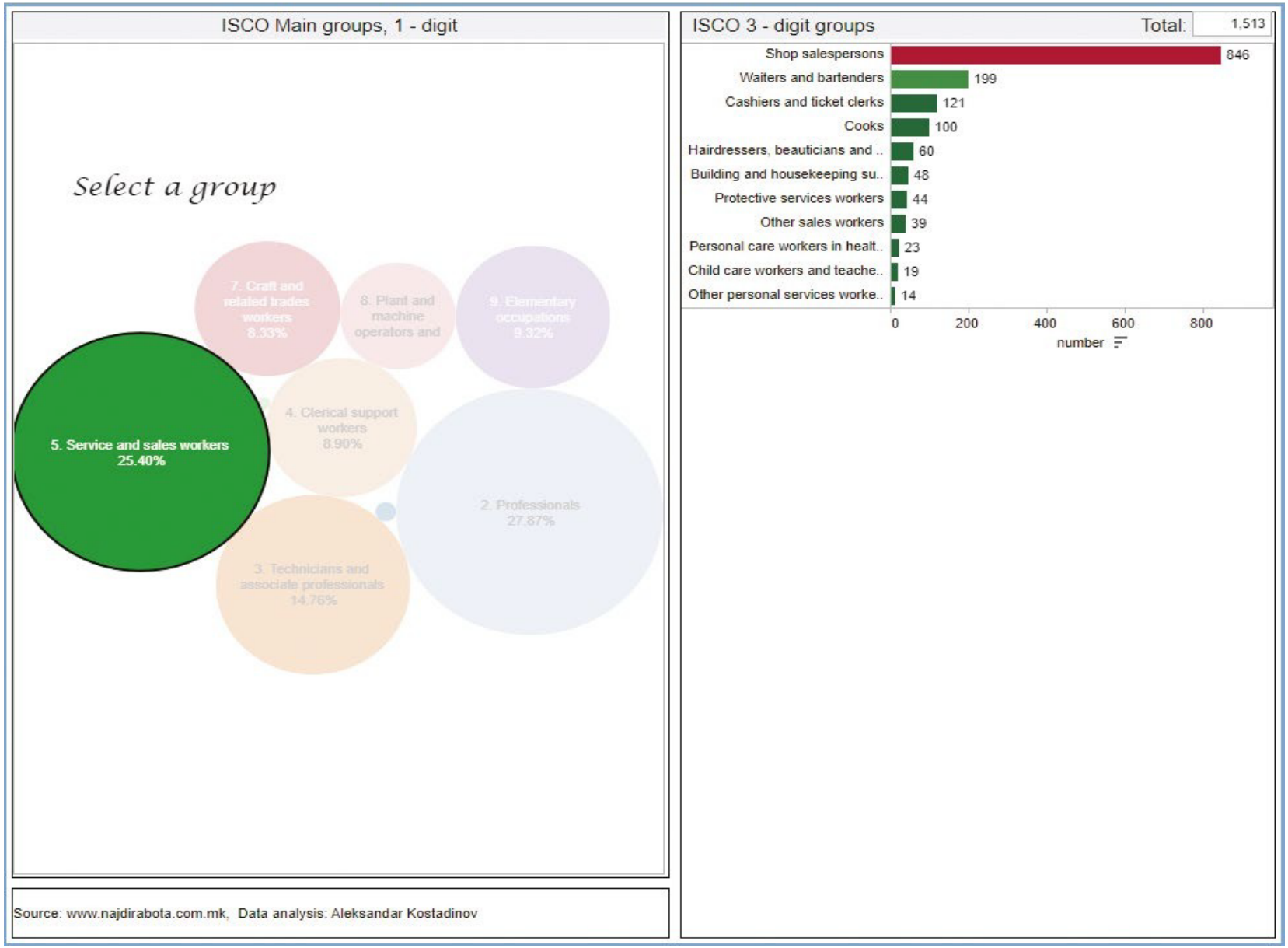


Figure 11.11. Word cloud representing the skills and qualifications most frequently demanded by employers looking for software and applications developers and analysts

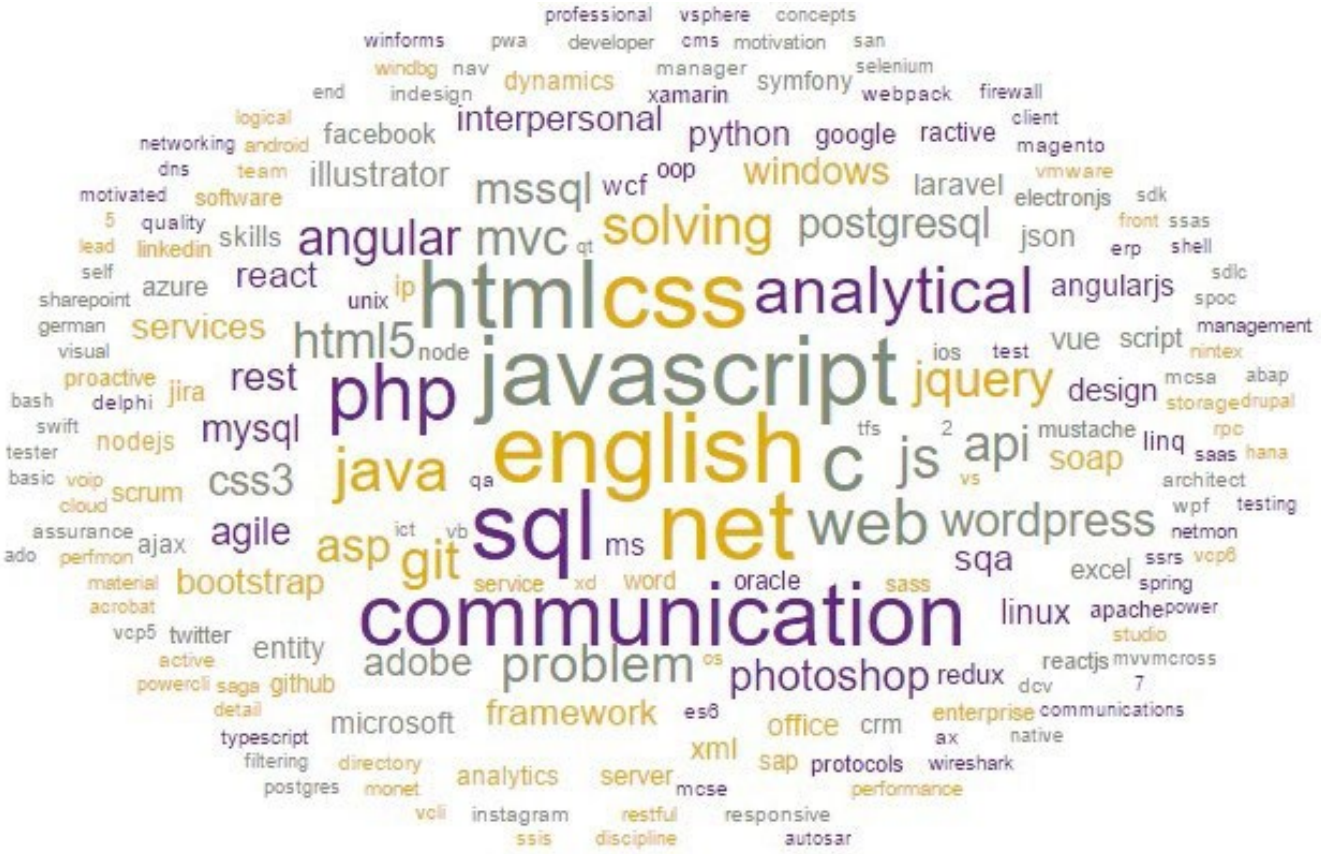
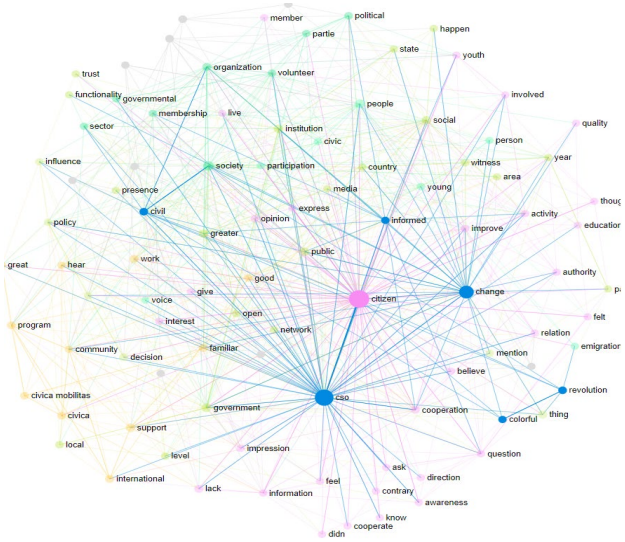


Table 11.3. Frequency of the top 16 most requested skills and qualifications for IT professionals – ISCO 251:
Software and applications developers and analysts

WEIGHT	WORD	WEIGHT	WORD
168	English	50	php
90	javascript	41	analytical
88	net	41	Web
80	sql	37	java
67	css	34	js
65	html	32	git
60	communication	31	solving
56	c	30	problem

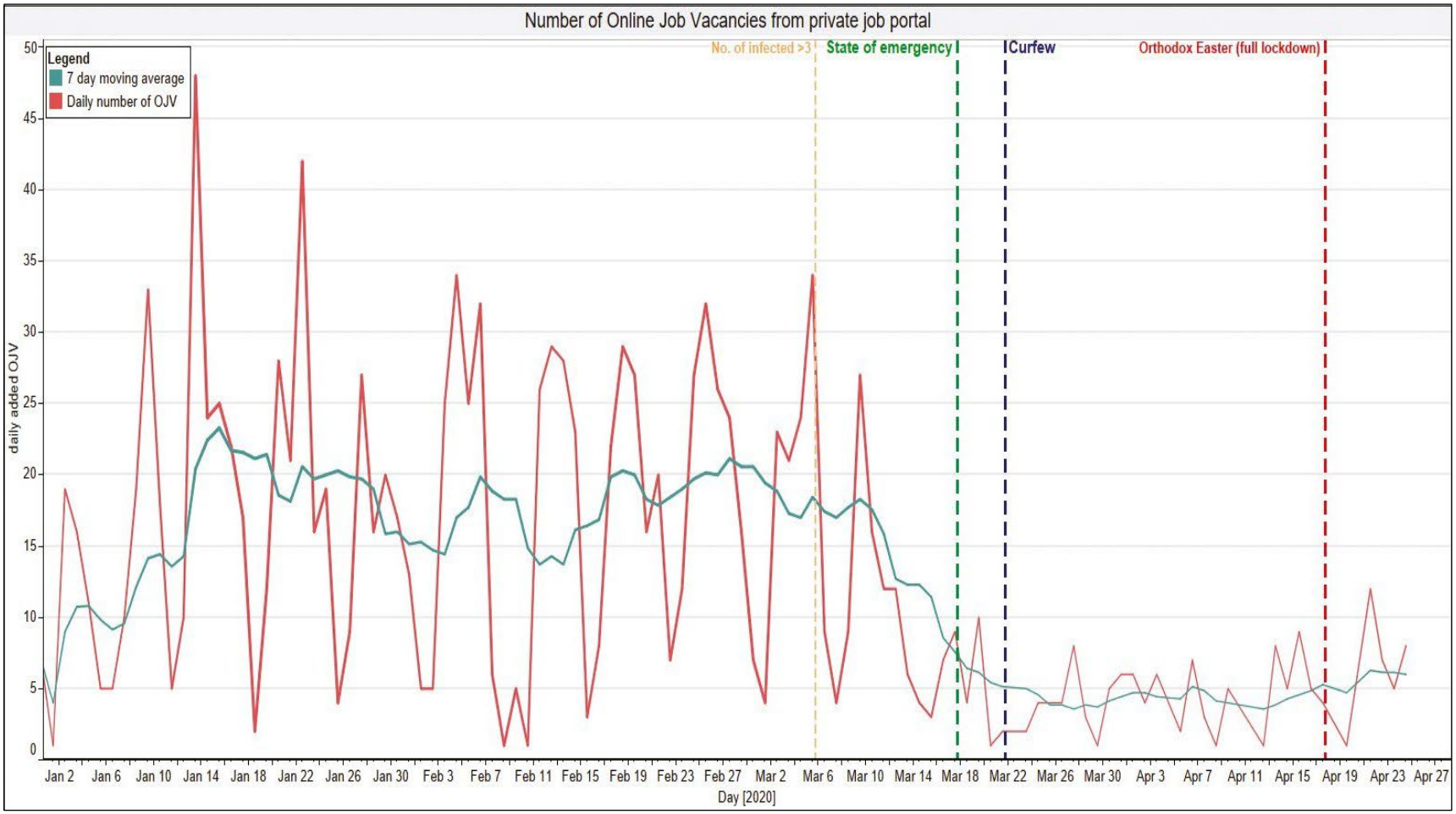
Next challenge: Natural language processing (NLP) and Artificial Intelligence for network analysis



AI-based GPT-3 Insight Recommender
Discover of the most interesting research questions and perform network analysis.

Real-time data and OJVs during the Covid-19 crisis

Number of daily and weekly online job vacancies on the job portal, 1 January–25 April, 2020



Conclusions

- Requested skills and occupations can be easily tracked, and the information utilised to quickly adjust policy responses to ensure a better matchmaking process in the labour market;

- The level of demand for technicians and associate professionals is similar and relatively high in both sets of data, while requests for plant and machine operators and assemblers is high only in the survey-based data;

- Issues with the sources related to: Agricultural workers, Public sector jobs;

- Possibilities for Geolocation of the posts, obtaining through API or data sharing;

- Better data registry system could significantly increase the effectiveness and comparability of data.

If data entry in online job portals followed some basic rules – for example, introducing ISCO occupations, using ESCO libraries for skills and qualifications, properly entering job location, time and NACE sector – this would produce a more useful and relevant dataset for analysis.

New possible sources:

- Booking.com, Trivago and similar portals may share statistics for a reservations in certain area
- Linkedin as a source of skills supplies and movements of professionals

Thank you!

Q&A

aleksandarkostadinov@yahoo.it