IRONHACK DATA CONSULTING TEAM

Analysts:

- Alejandro Aboy
- Valentin Kalinov
- Sergio Manzo

Objective

IRONHACK is exploring to expand the brand into a **NEW** location in Europe. The project has been assigned to a data analyst team to seek the viability of the project by narrowing down the possibilities of countries based on a study.

Project structure:

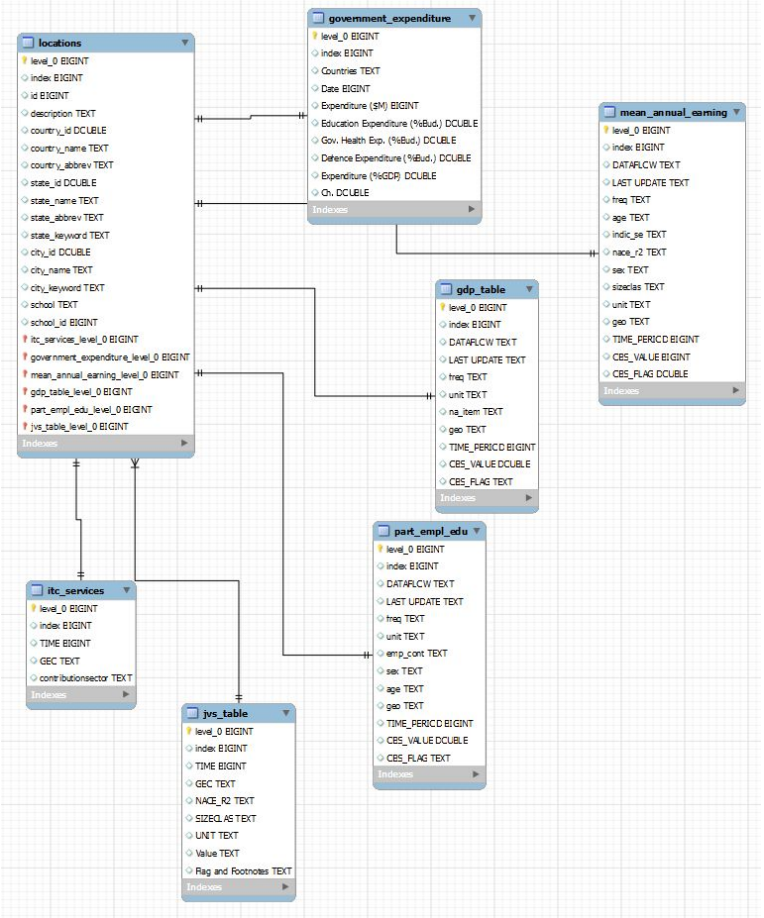
Define a data driven model to help defining a **NEW** campus for IRONHACK .

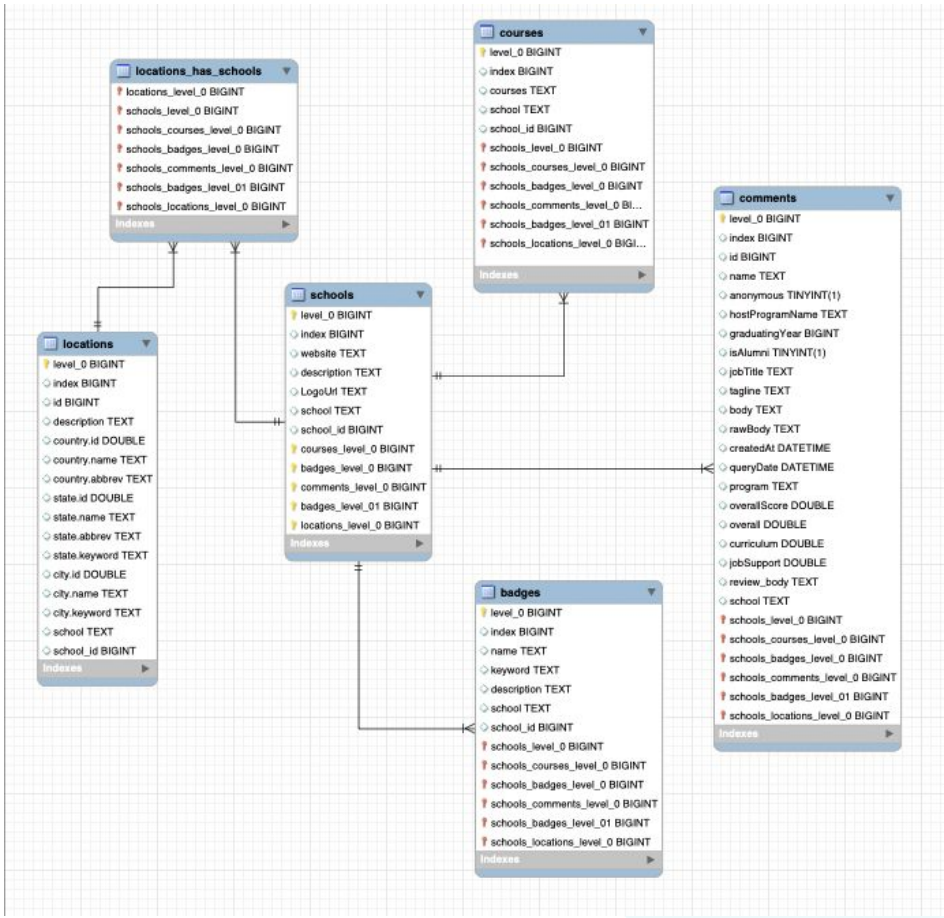
Use of different datasets to extract the necessary insights:

- Switchup data : to understand IH performance and presence in the market.
- Eurostat and OECD: to analysed socio economic data of the different countries.

Narrow the possibilities of countries based in facts .

ERD Locations / ERD SWITCHUP





Ironhack performance (Alumni rating)

For all the courses and schools the average Overall Score is 4.683. IRONHACK average Overall Score is 4.797

Types of ratings:

- Overall Score*
- Overall
- Curriculum
- JobSupport

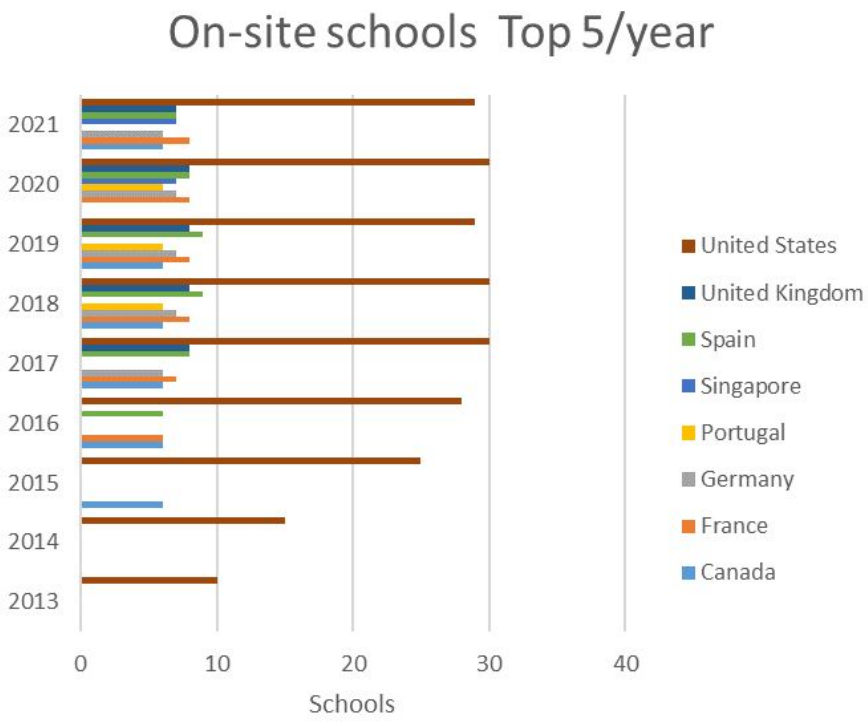
Program/Courses best rated in IRONHACK in the last 3 years:

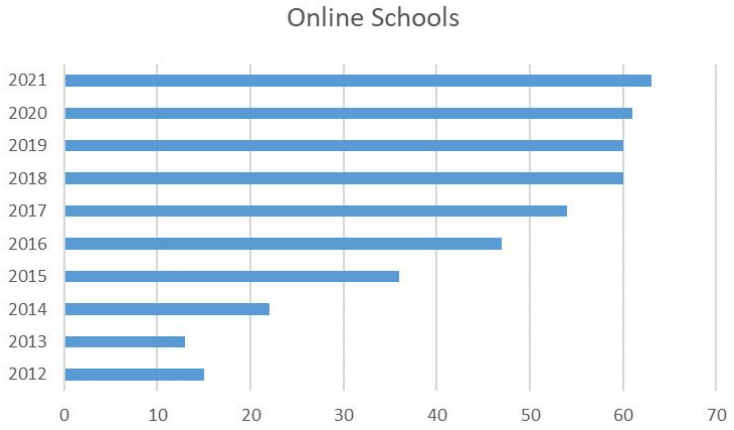
- Cyber Security Bootcamp (5)
- Part-time Web Development (4.93)
- Part-time UX/UI Design (4.8)
- Data Analytics Bootcamp (4.5)

Job Titles whom more rated more for IRONHACK courses:

- UX/UI Designer
- Full Stack Developer
- Web developer
- Product Designer

Evolution of schools through time





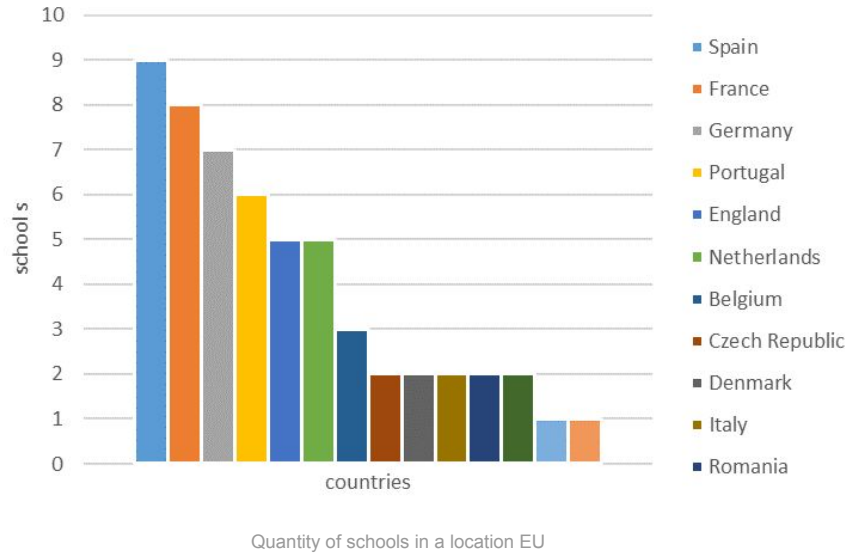
INSIGHTS:

- EUA dominant market.
- 2016 Breaking point in growth (EU).
- Online schools >10x (no EUA)

Competitive analysis (Market Share in Europe)

Schools by Country based on:

- Schools On-site
- comments rated over mean 4.683)



Quantity of schools in a location EU

Spain:

1. Codeworks - 4.947
2. Le-wagon - 4.932
3. Data-science-dojo - 4.879
4. 4geeks-academy - 4.878
5. Wild-code-school - 4.828
6. Neoland - 4.801
7. *Ironhack - 4.797
8. React-graphql-academy - 4.764
9. Uxer-school - 4.719

Belgium:

1. La-capsule - 4.98
2. Le-wagon - 4.93
3. Wild-code-school - 4.828

INSIGHTS:

- Eliminate countries where Ironhack already has presence.
- Avoid schools saturation saturation.
- Identify principal competitors by country.

Finding additional data sources

Our approach:

- We are looking for above EU average rich countries
- With growing IT sector
- Spending above average on education
- Scoring above average on innovation indexes

Datasets:

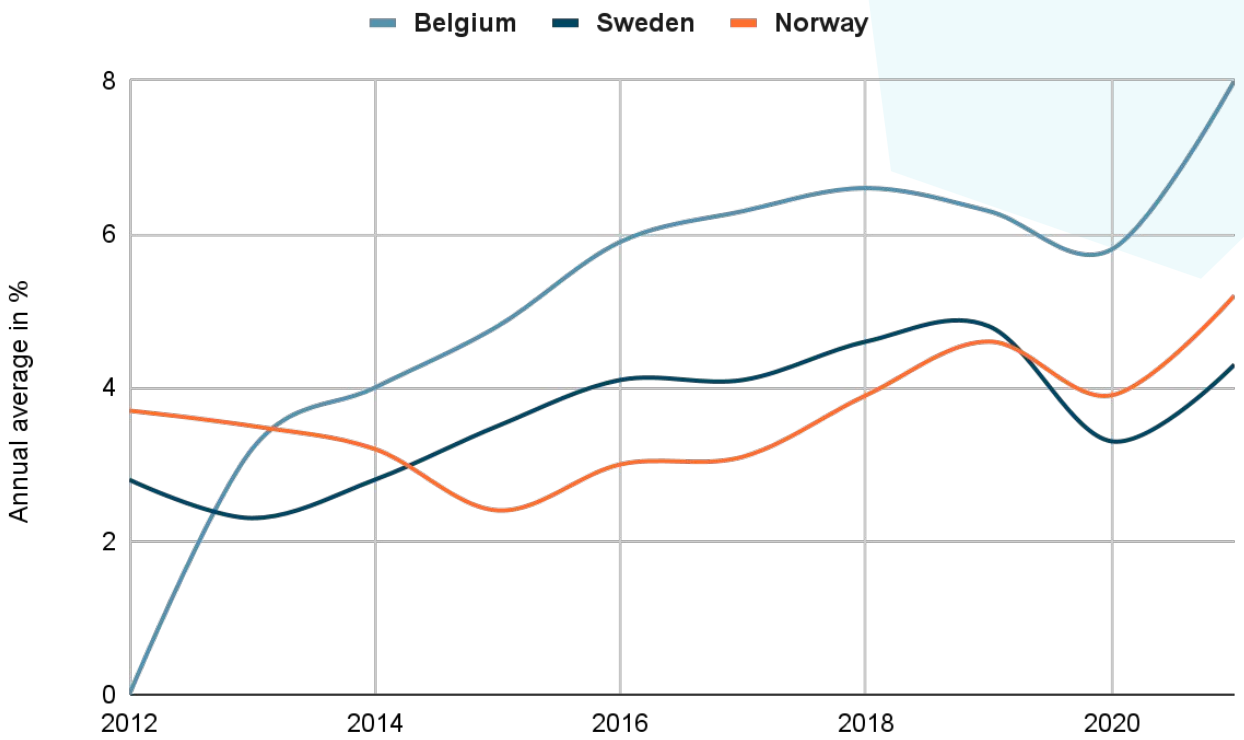
- Economic data
- Labor market data
- IT sector data

Vacancies in Information and Communication sector

Our top picks:

1. Belgium
2. Sweden
3. Norway

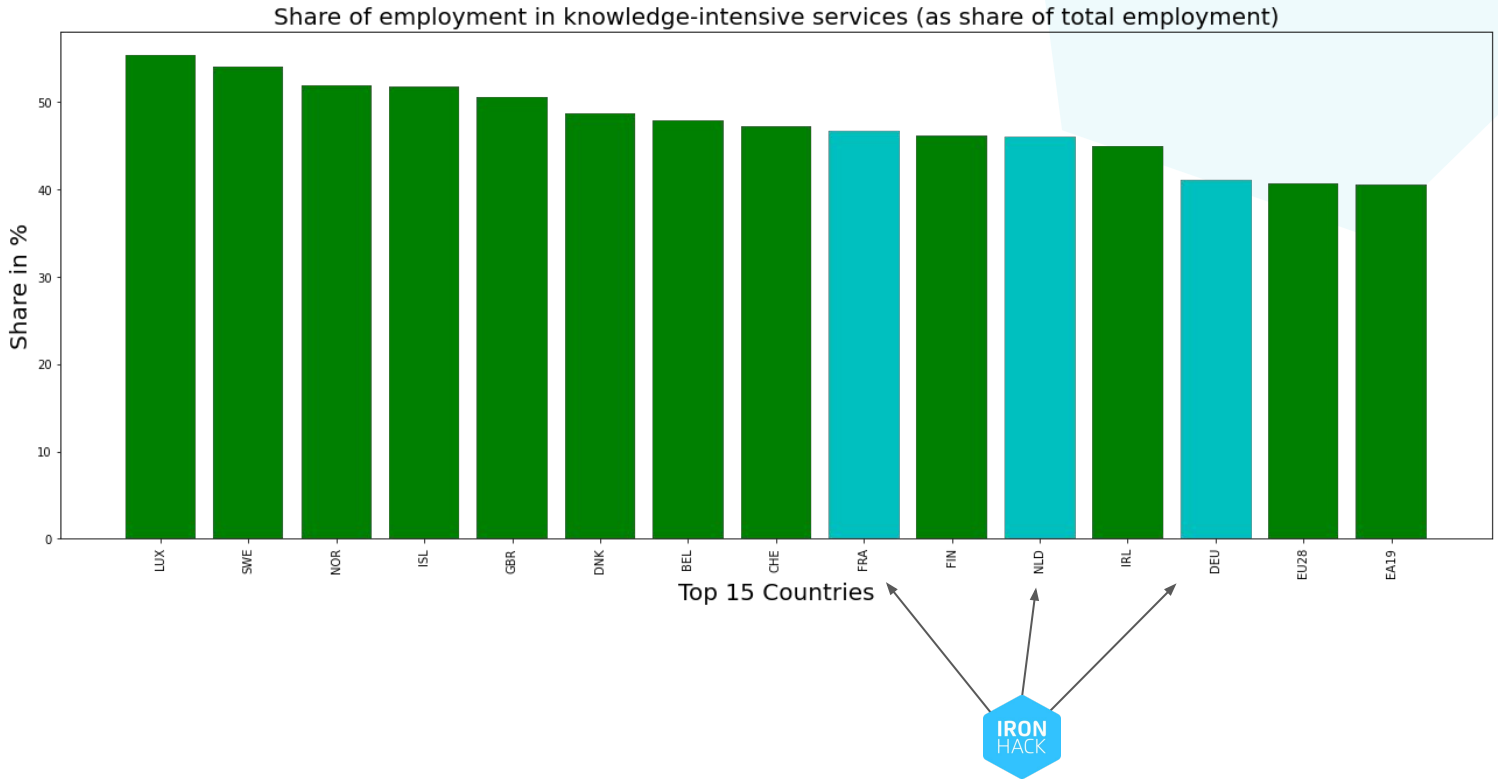
Vacancies in IT sector are rising!



Employment in knowledge-intensive services in 2019

Our top picks:

1. Belgium
2. Sweden
3. Norway



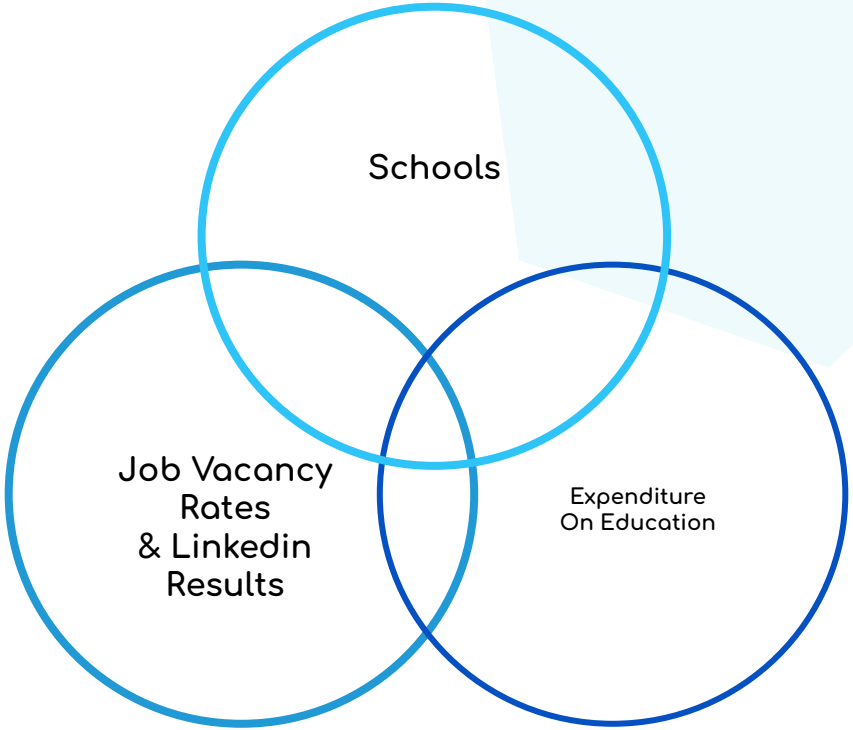
“New campus” data-driven model - overview

The goal is to find the best match between:

- *EE (Growth on Expenditure on Education)*
- *JVR (Growth on IT Vacancy Rates)*
- *How many schools/IT jobs demand that market has (and how they are performing)*

By crossing these dimensions, we can understand how to fit the IT jobs demand of an specific market that is already investing in Education and is not too crowded with many bootcamp schools.

To start this analysis, we are excluded countries where Ironhack already is and over-crowded cases like Canada or London.



"New campus" data-driven model - example of approach

We start sorting the sources to find the countries that are growing YoY spend on education and have growing IT vacancy rates. Additionally, we add more context with Linkedin Search to see if our curriculum could satisfy the demand on that country for each specific program. Finally, we check whether there are many competitors or not.

Country	EE21 vs EE20	JVR_2020	JVR_2021	Linkedin results for WD	Linkedin results for DS	# SCHOOLS	SCHOOLS
Belgium	+8.2%	5.8%	8%	720	875	3	Le-wagon, la-capsule, wild-code
Norway	+6.6%	3.9%	5.2%	192	188	1	Le-wagon
Sweden	+3.5%	4.8%	4.3%	951	864	1	Nucamp (online)

“New campus” data-driven model - conclusions

- **Sweden** has no competitors for physical tuition and the EE & JVR are not as high as Belgium, nonetheless the vacancies on Linkedin are a good sign of IT jobs demand.

- Cases like **Belgium or Canada** are covered by “french speaking” players. These schools have brand awareness as french bootcamp providers, so it’s easier for them to land in those countries. Adapting tuition process to native languages would provide a better value proposition and also will avoid students filtering for not having a good english level.

- Le wagon has a franchise business model, so it’s common to see them with a more distributed presence worldwide.

- The top rated program (Switchup info) for these locations is Web development, so it will be the best option to land in those countries, leaving Data science as the best 2nd program. If we decide a program based on job searches, Data Science will be a better match.

“New campus” data-driven model - conclusions

Thanks for your time!

Any questions?

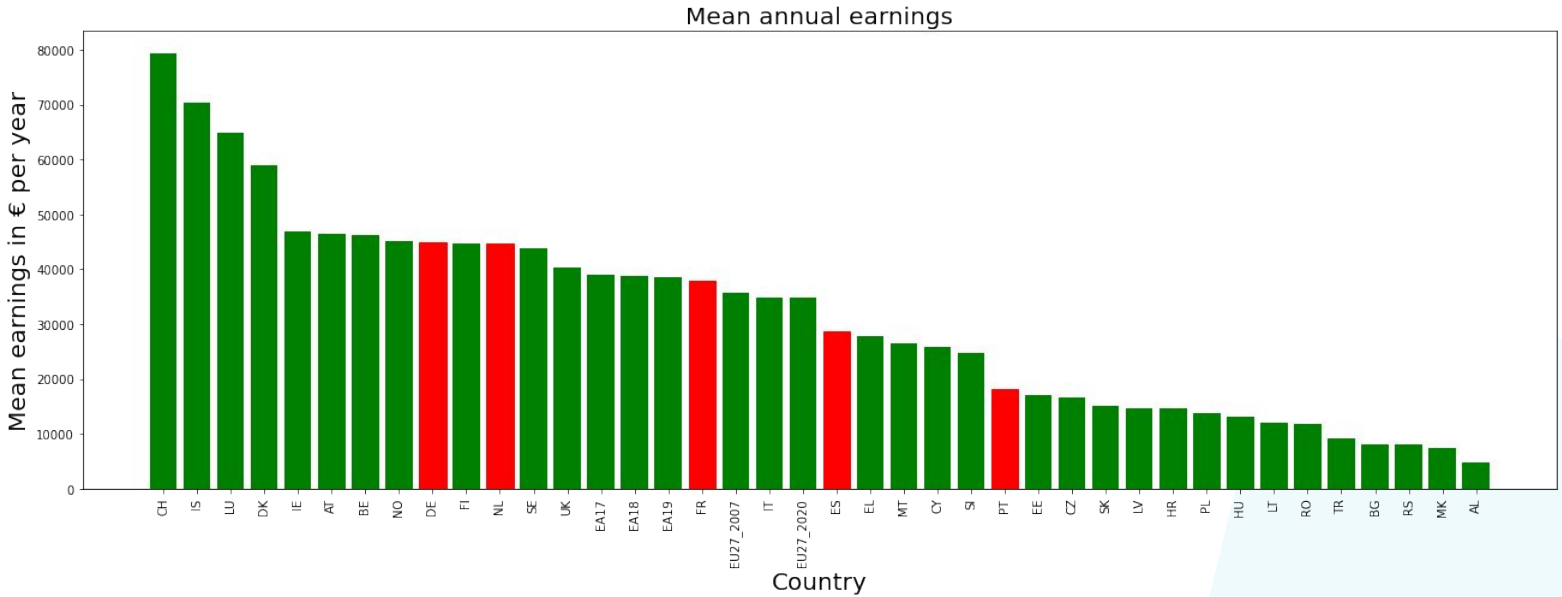
Dataset Sources

- *Government Expenditure in Education Map (as % of GDP), Eurostat*
- *Job vacancy rate in Information and communication sector, Eurostat*
- *Mean annual earnings by sex, age and economic activity, Eurostat*
- *Participation rate in informal learning by learning form and age, Eurostat*
- *Participation rate of employees in education and training (last 4 weeks) by sex, age and employment contract, Eurostat*
- *Percentage of the ICT sector in GDP, Eurostat*
- *Regional Innovation: Knowledge and high technology industries, share of employment in high tech service industry, OECD*

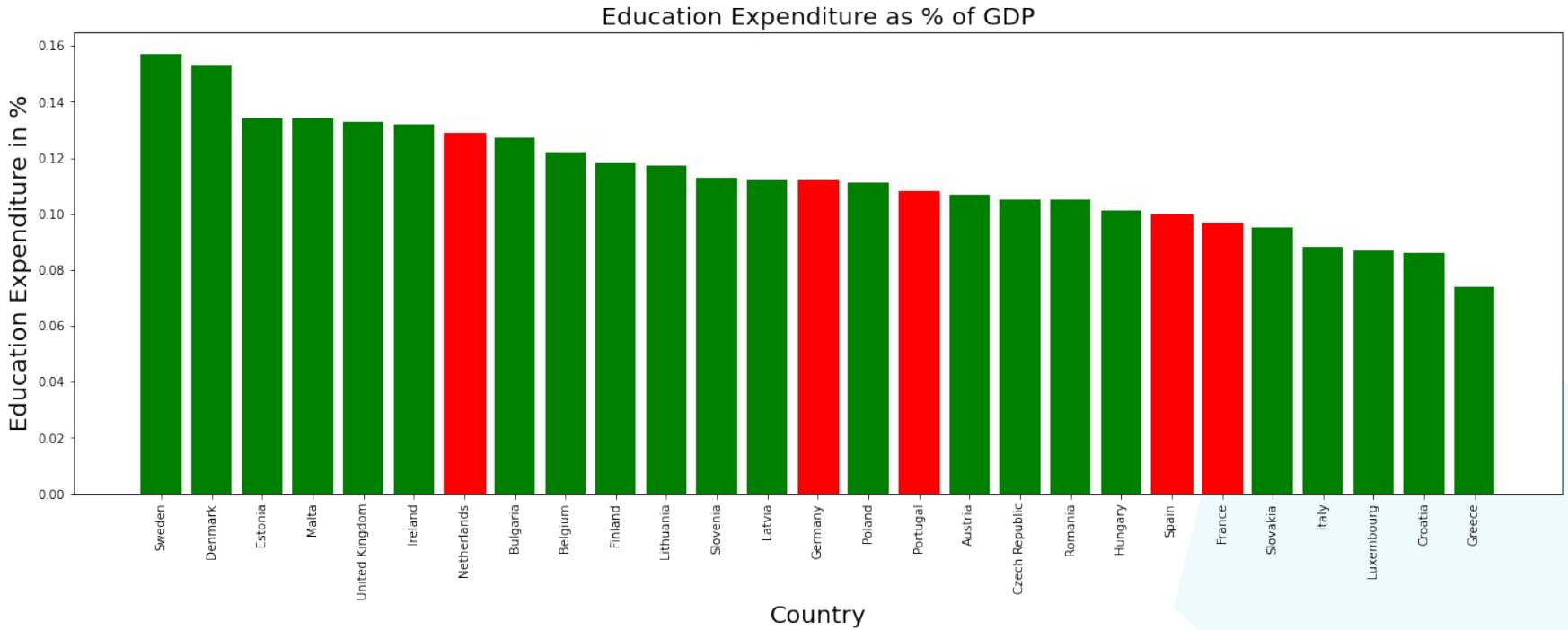
Notes

1. “We are data consulting… and we’ve created a data driven model to decide where to open a new campus for IH. First, let’s understand IH performance according to switchup data. Sergio
    a. ERD - Sergio
    b. Competitive analysis (Slide 8) -Sergio
    c. IH score on different metrics (Slide 6) Sergio
    d. Industry growth over time (Slide 7) - Sergio
2. Additionally we pulled data from Eurostat and OECD to add more context to our model and decision - Valentin
        i. We look at economic data
        ii. And labor force data (with focus on IT sector)
3. We crossed these data sources to find our best fit for a location (based on quantitative and qualitative analysis) -Alex
    a. Compare vacancy rates vs expenditure on education per country
    b. Analysing how crowded the market is on specific countries (for example London is overcrowded and north america)
    c. Action plan based on previous insights
        i. Belgium, France, Canada - french language or Sweden, Norway based on economic data, etc.
        ii. Most engaging bootcamp based on job vacancies (based on Linkedin analysis of open positions)

Annual earnings results



Government Expenditure in Education result



IRON HACK

NOTES

IT job demand not satisfied result

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Conclusion country selection

Options:

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- 2
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Sources

- *Participation rate in informal learning by learning form and age*
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- *Regional Innovation: Knowledge and high technology industries, share of employment in high tech service industry*
- *Percentage of the ICT sector in GDP*
- *Government Expenditure in Education Map*

Our Story

We are a consulting company and got approached by Ironhack which had a Series B round of $20M and is looking to expand its market share in Europe. We are a consulting company doing the analysis for Ironhack.

EY = Eh Why?

Steps

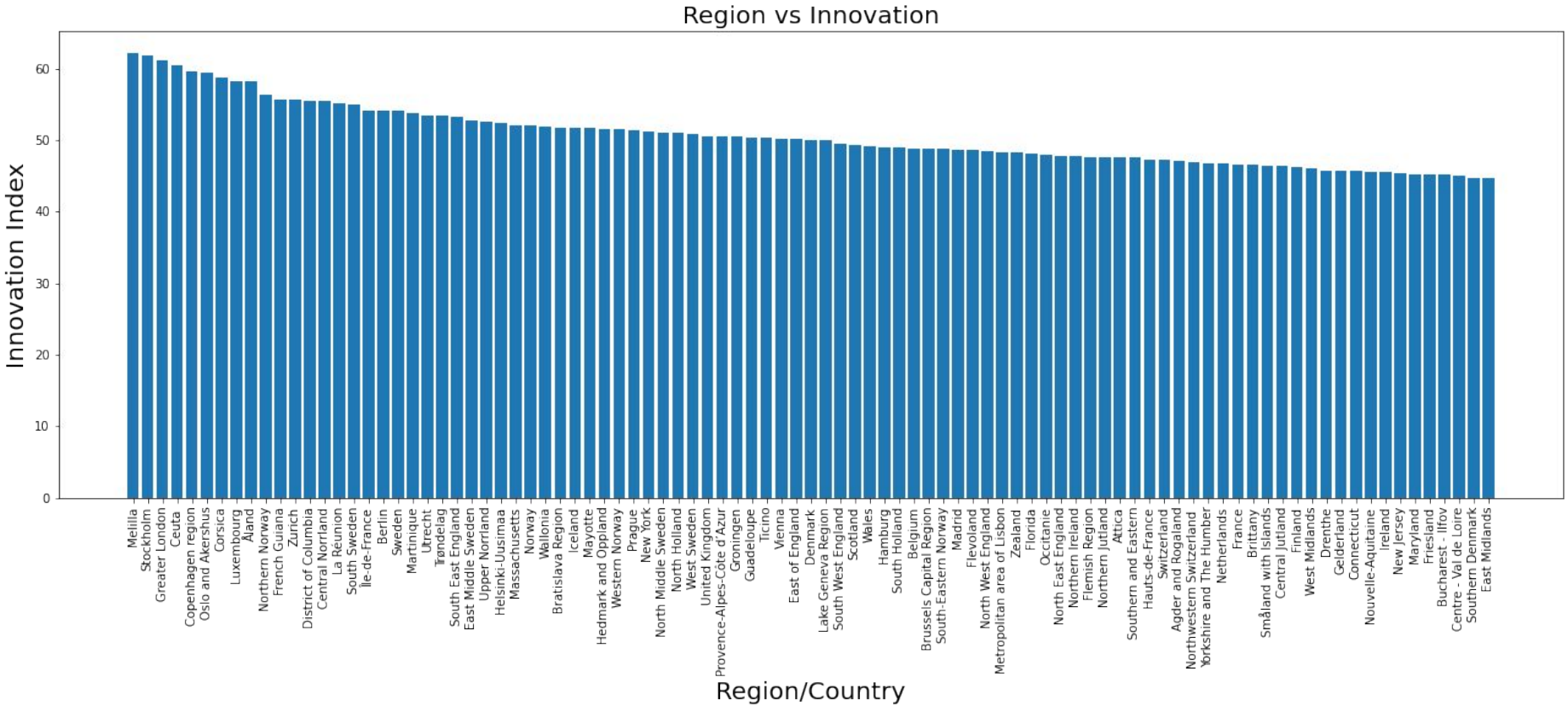
1. GDP Analysis of 11 countries
2. GDP vs ICT sector (11 countries?)
3. Additional datasets: Innovation investments, Employment rates in ICT sectors, etc.
    a. R&D data
    b. Demand by role in IT sector (Search EUROSTAT), Open positions in IT sector
    c. GDP per capita/population for our top 11 cities
    d. Average age able to study at a bootcamp (less than 25 (study, lack of funds)
    e. Industry growth
    f. Skill demand by country in IT
    g. Average bootcamp tuition price (to argue the need of a rich country) (maybe take minimum/average salary) (take Ironhack as base)
    h. Top bootcamp employers (check if these companies work in our target country)
    i. Find the share of IT industry in each country

Brainstorm Idea (Valentin)

1. *So we start with our SQL data and check out which cities in Europe have the most available courses. Our thesis would be that these are overcrowded and we are looking at alternatives*
2. *Then from our data we check out where is Ironhack already available. (yes we have it online, but let's assume we don't)*
3. *We pull GDP data per country from OECD and work with pandas*
4. *We pull data on Innovation and R&D spending from countries as well*
5. *We start looking at the data and analysing where we could have a potential location*
6. *Since bootcamps are not cheap, we need a relatively rich region/country (for now i have identified Prague Czech Republic)*

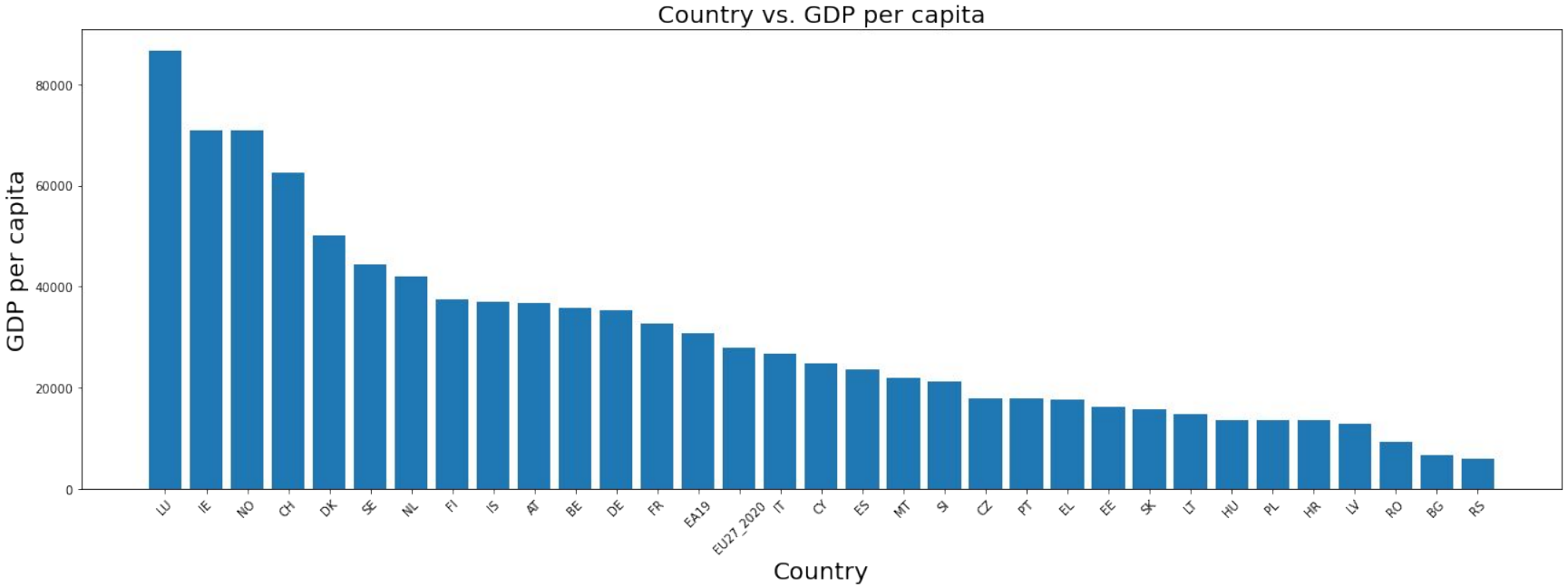
The next few slides try to tackle the problem

Where to open a new IRONHACK school in Europe



Where to open a new IRONHACK school in Europe

We take the GDP per Capita as a starting point



Where to open a new IRONHACK school in Europe

- Potential location would be Prague Czech Republic
- *We need to brainstorm a little more*

Find info regarding Europe tech hubs locations

Growth in IT job position per country / Most demanded IT roles per country

Job vacancy rate Table

Job vacancy rate by NACE Rev. 2 activity - annual data

Sectoral analysis

One of the six subsectors (at the division level) dominated the information and communication services sector in the EU, namely computer programming, consultancy and related activities (Division 62). This subsector generated almost half (44.4 %) of sectoral value added and contributed to 53.8 % of the employment in 2018. The second largest subsector was telecommunications (Division 61), which accounted for 14.4 % of the information and communication services employment and contributed 26.3 % to sectoral value added.

The job vacancy rate (JVR) measures the proportion of total posts that are vacant, according to the definition of job vacancy above, expressed as a percentage as follows:

JVR = number of job vacancies / (number of occupied posts + number of job vacancies).

The quarter-on-quarter and year-on-year changes are expressed in percentage points.

https://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do

Where to open a new IRONHACK school in Europe

Top cities outside US

city_name	count(*)
London	10
Barcelona	8
Singapore	7
Paris	7
Madrid	6
Lisbon	6
Toronto	6
Berlin	6
Amsterdam	5
Lyon	4
Mexico City	3

Where to open a new IRONHACK school in Europe

Current Ironhack cities

city_name	school	description	country_name
Berlin	ironhack	DE	Germany
Mexico City	ironhack	MX	Mexico
Amsterdam	ironhack	NL	Netherlands
Sao Paulo	ironhack	BR	Brazil
Paris	ironhack	FR	France
Miami	ironhack	US	United States
Madrid	ironhack	ES	Spain
Barcelona	ironhack	ES	Spain
Lisbon	ironhack	PT	Portugal

Competitive analysis (Market Share in Europe)

Schools by Country based on:

- Schools On-site
- comments rated over mean 4.683)

Spain:

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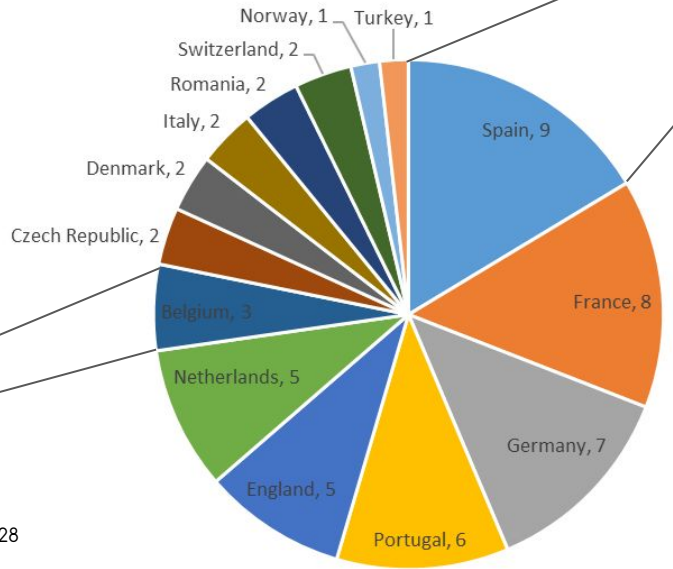

Quantity of schools in a location EU

Belgium:

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3. Wild-code-school - 4.828

INSIGHTS:

- Eliminate countries where Ironhack already has presence.
- Avoid schools saturation saturation.
- Identify principal competitors by country.

2019 vs 2020 on spent on Education

Countries	Date	expenditure_millions	expenditure_gdp	expenditure_bud...	YOY_growth
China	2019	4892708	34.1	11.5	1.19
Japan	2019	1916314	37.3	8.4	0.32
Australia	2019	541105	38.9	13.5	1.98
South Korea	2019	372426	22.6	25	2.17
Israel	2019	154933	38.9	15.5	-0.45
United Arab Emirates	2019	127267	30.5	10.3	1.6
Albania	2019	4489	29.4	13.4	0.55

The best opportunities for 2019 analysis are not in Europe so we won't consider them. Additionally, the growth rates aren more conservative than 2020 numbers.

Countries	Date	expenditure_millions	expenditure_gdp	expenditure_bud...	YOY_growth
Italy	2020	1078792	57.1	8.8	8.6
Canada	2020	870446	52.8	12.2	11.87
India	2020	828474	31.1	12.8	4.02
Russia	2020	583947	39.4	14.3	5.54
Belgium	2020	309044	60	12.2	8.2
Poland	2020	291106	48.7	11.1	6.9
Sweden	2020	285556	52.6	15.7	3.5
Switzerland	2020	284610	37.8	15.5	5
Turkey	2020	245265	34	12.4	-1.68
Norway	2020	211584	58.2	15.6	6.6

Huge growth rate on expenditure on Education for the highlighted countries. This could be an opportunity to choose a country to open a campus.

IT vacancy jobs evolution 2019 - 2020 - 2021

year	country	IT_vacancy_rate
2019	Belgium	6.3
2019	Netherlands	6.2
2019	Austria	5.4
2019	Sweden	4.8
2019	Norway	4.6

year	country	IT_vacancy_rate
2020	Belgium	5.8
2020	Netherlands	4.7
2020	Austria	4.4
2020	Czechia	4.4
2020	Norway	3.9

year	country	IT_vacancy_rate
2021	Belgium	8.0
2021	Austria	6.6
2021	Norway	5.2
2021	Denmark	4.4
2021	Sweden	4.3

We can see special situations for Belgium, Austria and Norway with growth on IT vacancy rates.

Demand is rising YoY and this cause more vacancies on IT candidates because there might not be an offer of IT education that fits the market needs.

Belgium and Norway are also 2 great examples of growth on expenditure on education. (Check previous slide). This is a good starting point to analyze possibilities of government individual funding for educational purposes.

Understanding opportunities with competitors

country_name	schools_cou...
Canada	6
Belgium	3
Norway	1

country_name	school
Norway	le-wagon
Canada	brainstation
Canada	general-assembly
Canada	juno-college-of-technology
Canada	le-wagon
Canada	lighthouse-labs
Canada	product-school
Belgium	la-capsule
Belgium	le-wagon
Belgium	wild-code-school

- **Note**: only le-wagon has a franchise model, not a branded model for opening campuses. So it's easier for them to have presence all over the world, like **Norway** case.
- **Canada & Belgium**: la-capsule & wild-code-schools mainly work mainly on French speaking countries, so competition would be harder if the bootcamp are not taught in French.
- **Canada alone**: very crowded with strong players around the world.

Final words

“Opening campus” model:

- Cross expenditure growth on education to vacancy rates on IT related industries
- Understand country cultural dimensions that could make a difference (E.g language, physical vs remote, etc)
- Start with the best rated courses on that country (E.g Web development) or provide a different offer from the average, like Data Science.
- Optional, nice to have: Scrape & analyze Linkedin offers keywords related to those bootcamps for better curriculum refinement.

“New campus” data driven model

Reference:
- EE: % of growth on budget Education Expenditure
- JVR: IT Job Vacancy Rate
- SCHOOLS: count of schools in that country

Country	EE21 vs EE20	JVR_2020	JVR_2021	# SCHOOLS	SCHOOLS
Belgium	+8.2%	5.8%	8%	3	Le-wagon, la-capsule, wild-code
~~Canada~~	~~+11.87%~~	-	-	~~6~~	-
Norway	+6.6%	3.9%	5.2%	1	Le-wagon
Sweden	+3.5%	4.8%	4.3%	1	Nucamp

Huge growth rate on expenditure on Education for the highlighted countries. This could be an opportunity to choose a country to open a campus. We can see special situations for Belgium, Austria and Norway with growth on IT vacancy rates. Demand is rising YoY and this cause more vacancies on IT candidates because there might not be an offer of IT education that fits the market needs. **Belgium and Norway are also 2 great examples of growth on expenditure on education. (**Check previous slide). This is a good starting point to analyze possibilities of government individual funding for educational purposes.