

COMPANY LOGS PROJECT

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DATA

The data used in this project were **internal logs** of a Software Development company on the **assignment of tasks** to its employees covering the period 2014-16. It contained **46,367 tasks**, split into **264,521 actions**. The data required a lot of cleaning and restructuring.

Variables:

- task assignment and completion time
- minutes spent on an action recorded by the assignee, with timestamp
- total worked minutes of a task (sum of worked minutes of actions)
- estimate of total worked minutes made by assigner when assigning the task
- category, subcategory, type and source (internal/external) of the task,
- name, department, country and position of the assigner and assignee.

OBJECTIVES

- Find patterns in employee efficiency (also over time, across departments and countries) which might help identify areas where planning could be improved
- Improve estimate times when assigning a new task through a regression model

METHODS

- For employee efficiency analysis, relevant data on employee efficiency is extracted by restructuring and regrouping.
- In order to obtain improved time estimates of tasks, a regression model is built. Then the results of the model are compared against the company's own time estimates of tasks (variable EstimateInminutes) in order to see which one is more resultful.

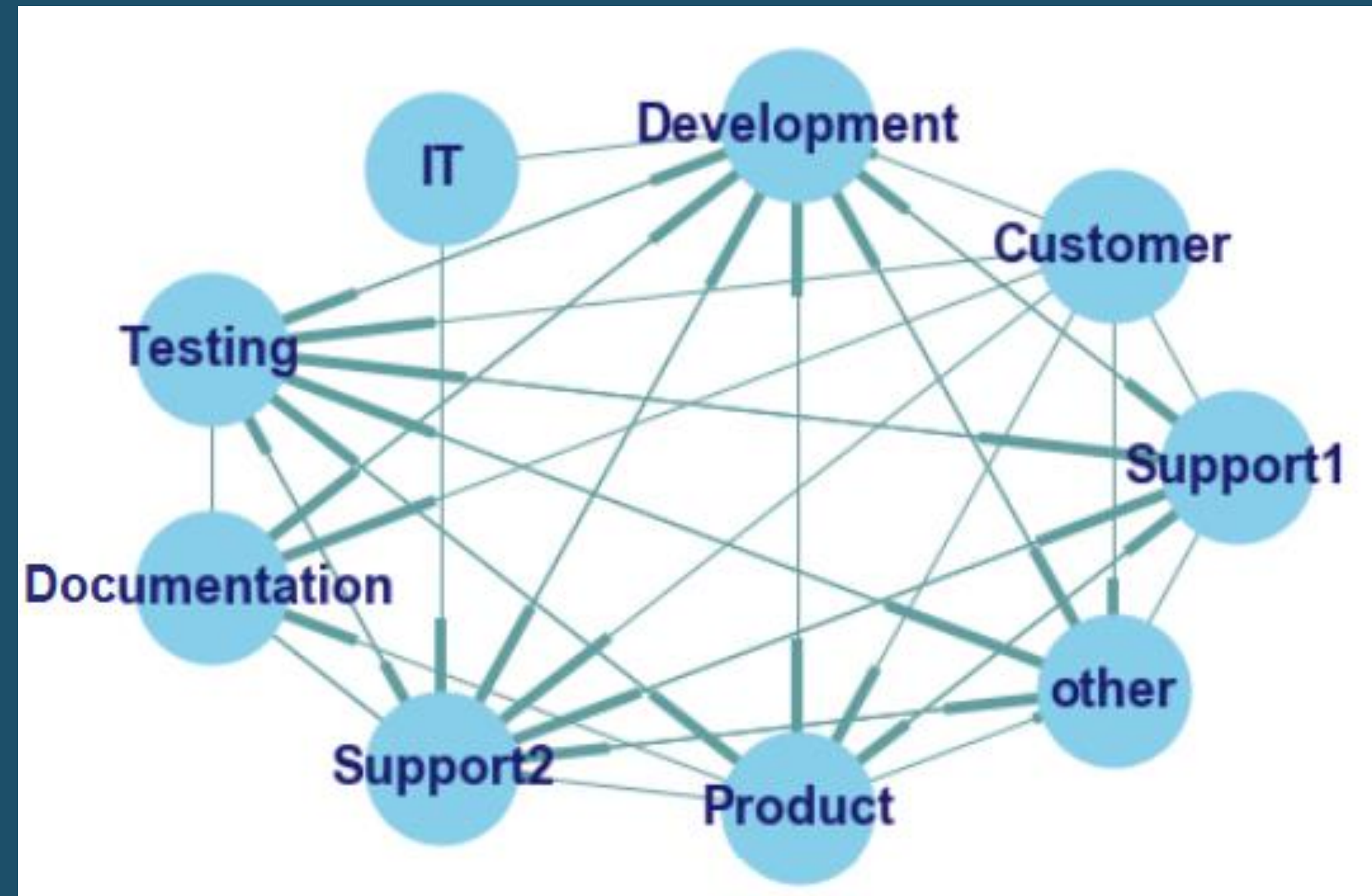
REGRESSION MODEL

- As the label to be predicted was worked minutes spent on a task, the actions (rows in the data) had to be aggregated into tasks.
- The features used in the model included category, source and the type of task, the person to whom the task was first assigned and his/her department and position, as well as the month. In the model, it was assumed that a task is assigned only to one person, i.e. that other people who will later be involved are not known at the time of assignment.

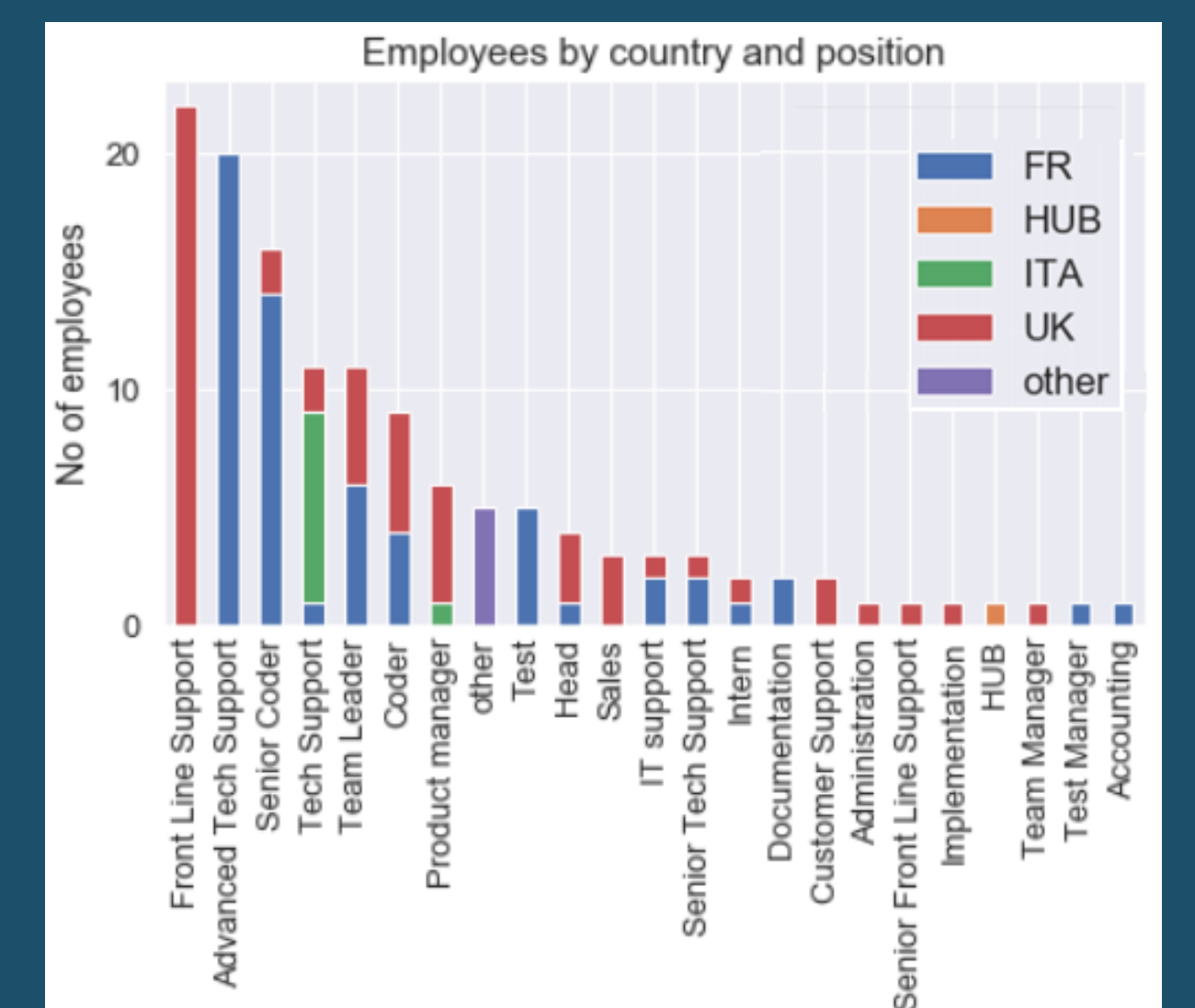
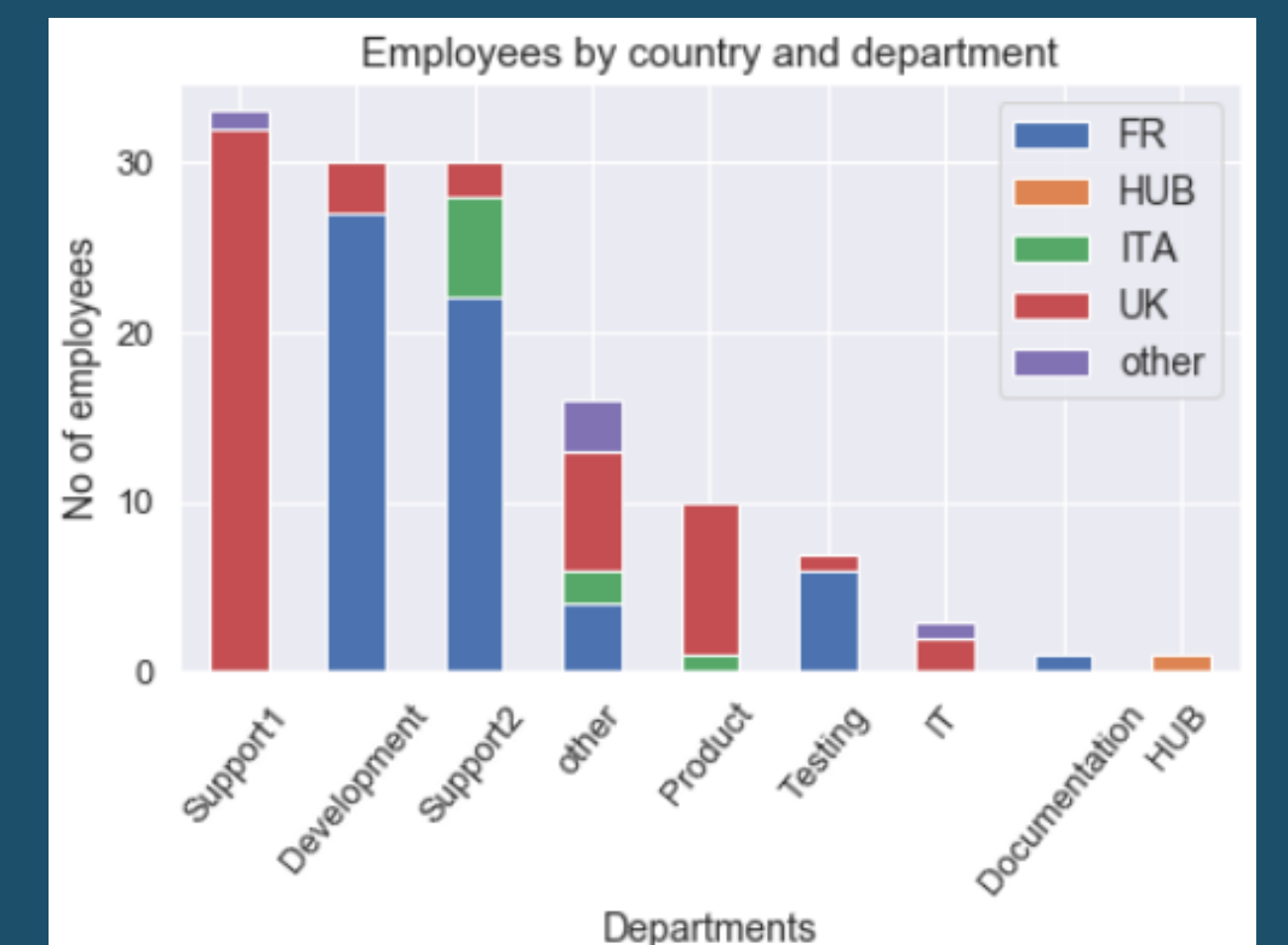
COMPANY OVERVIEW

The company operates in 3 countries (FR, IT, EN) and counted for 111 employees in 2016.

Who assigns tasks to who?



Bold parts indicate edge direction and volume of tasks assigned across departments.

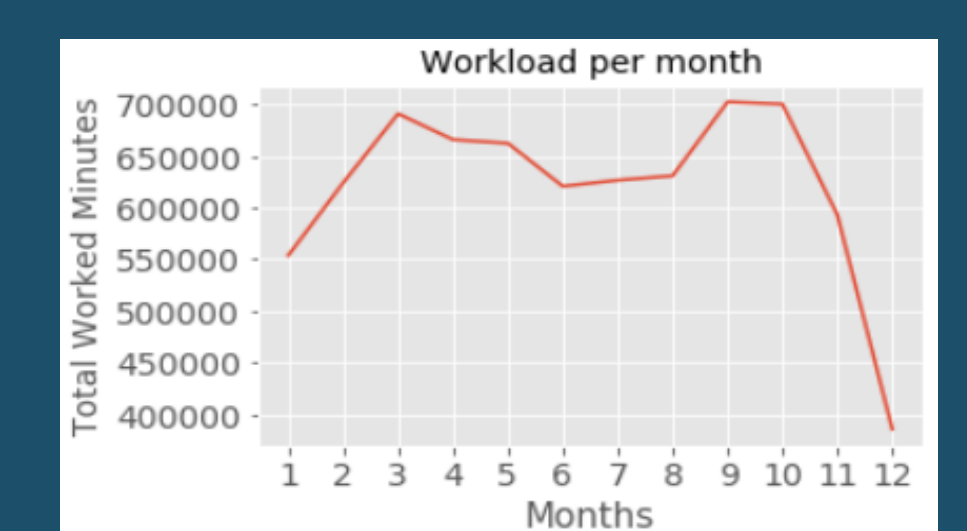
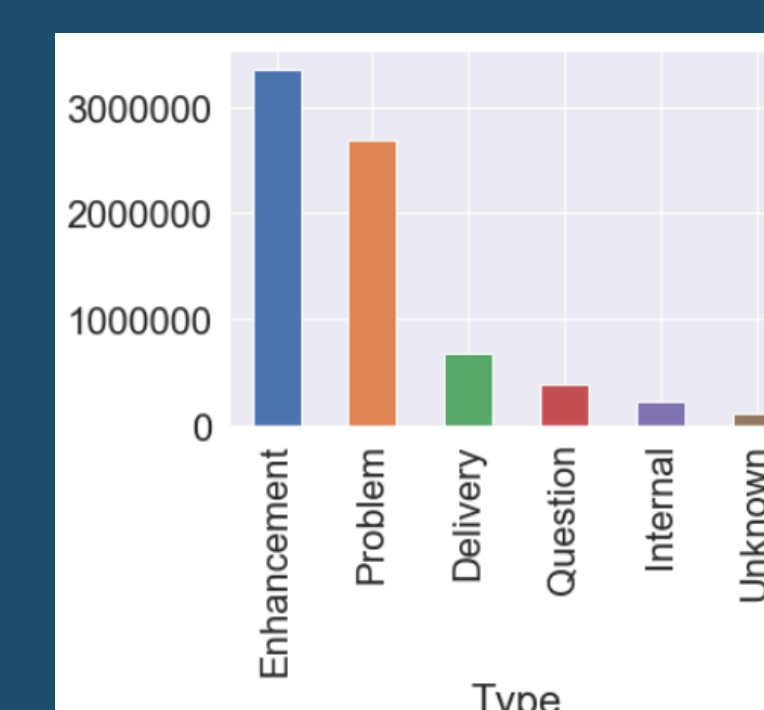
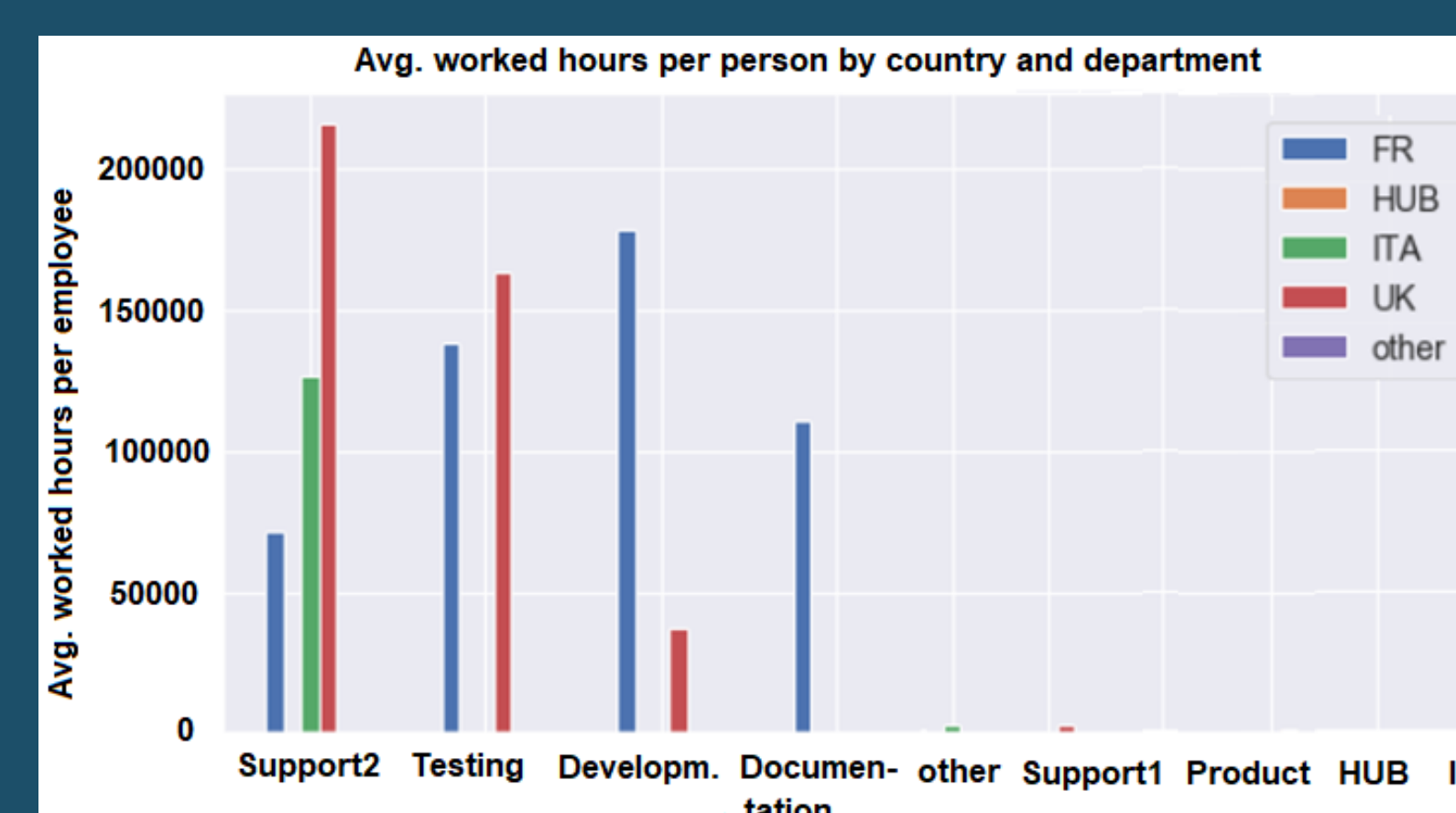
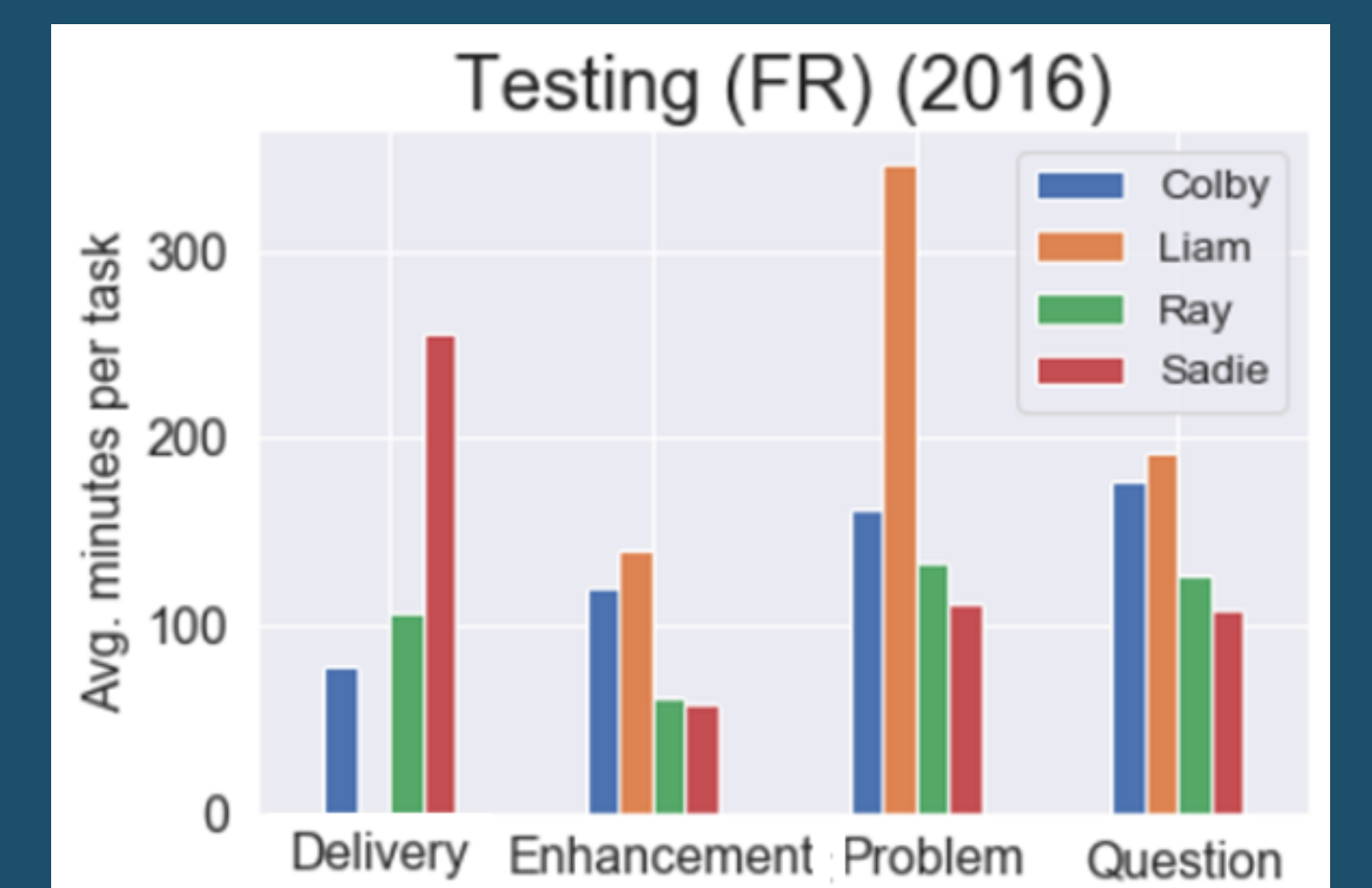


EMPLOYEE EFFICIENCY

The analysis included:

- total and avg. worked minutes by country, department and position
- analysis of workload over time, and by type of task
- analysis of efficiency (avg. worked minutes per task) of departments and of individual employees, given: task type, country, employee position, category or source of task

Position	Delivery	Enhancement	Internal	Problem	Question	Unknown
Advanced Tech Support	211	269	721	173	221	584
Coder	478	337	701	212	182	674
Documentation	240	213	620	49	45	0
Front Line Support	270	269	3822	124	164	451
Head	42	59	50	34	28	15
IT support	182	366	297	161	99	258
Product manager	250	65	308	40	0	15
Senior Coder	357	286	924	177	138	838
Senior Tech Support	268	141	513	100	107	333
Team Leader	178	141	684	95	81	865
Tech Support	327	164	2445	138	206	291
Test	181	106	2536	162	128	162
Intern	0	252	0	83	0	0
Test Manager	0	18	0	21	0	0
Accounting	0	0	1642	0	0	0



Results of efficiency analysis:

- The analysis shows for each department/country which type of tasks an employee is performing more efficiently than others, as well as who are the best and who are below average performers in each department, in terms of avg. time spent on a task.
- These results could be useful for the company's management in order to improve their planning by assigning tasks where a person is more efficient to this person, or deciding which employees might need further training to improve their efficiency.

Results of the model:

The RMSE of the model was really high. Despite this, our model outperformed the company's own estimations (RMSE of 2269 for the company's own estimations against a RMSE of 520 for the predicted ones when the values were compared to the actual worked minutes) in case of tasks lasting up to 1 month. However, good performance was partly due to some of the company's own time estimations being very much off (considerably higher than actual worked minutes) in case of some tasks.

