EESTI X-TEE HICCUPS
Joosep Tavits, Mari Seeba

TARTU ÜLIKOOL · UNIVERSITAS TARTUENSIS · 1632

Introduction

The business owner designs or redesigns the internal processes, service level agreements, plans the maintenance and monitors the service. For that the business owner has to assess its services security needs (availability, integrity and confidentiality) based on the users expectations. The presented study introduces some simple proof of concept models to business owners and explains how they can benefit from X-tee monitoring log data to assess some aspects of service availability needs.

Objectives

1) How to visualize real life events correlation with service request logs?
2) How to appoint the service high-demand business hours?
3) How to find suitable systems maintenance time to service?

Datasets and methodology

Datasets:
X-tee monitoring datasets can be downloaded by day from https://logs.x-tee.ee/EE/gui/ and filtered based on service. To compare with other correlated events we used https://koroonakaart.ee/et and public information about state exams.

Methodology:
Workflow is visualized on the block schema on the right. The most crucial part of working with X-tee logs was converting the timestamps from milliseconds to datetime values in the correct timezone.
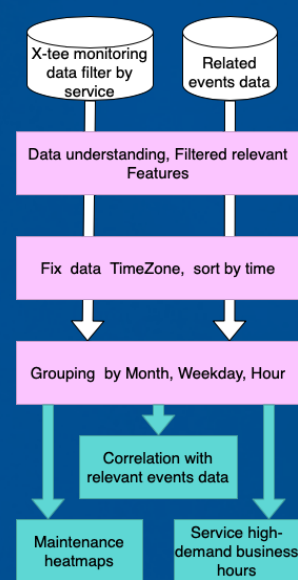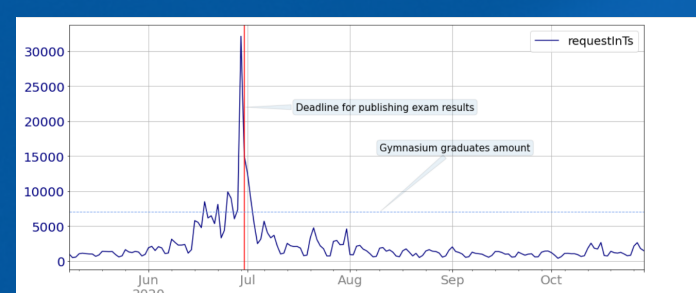

Correlations with real life events

Here we present two examples of services experiencing higher-than-usual amounts of requests due to generally predictable real-life events.

The first example is comparing COVID-19 tests done and the amount of queries made to patient portal distributed by days. We found a strong correlation between these two events.
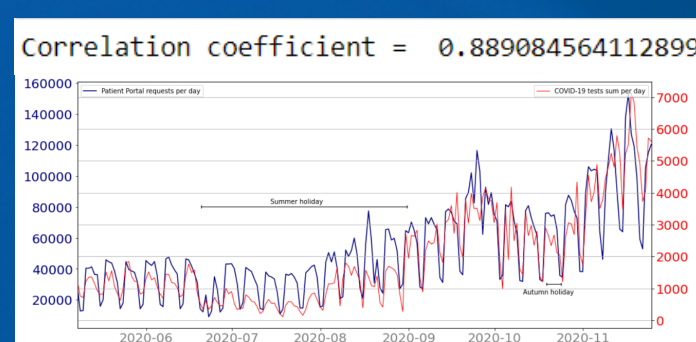
The second example shows that innove exam portal receives a significantly larger amount of traffic in June, which is when high school exam results are made available.

Finding suitable system maintenace times

### Patient portal
Observations:
Observing queries to patient portal, we find that due to the COVID-19 situation, the amount of traffic on patient portal grows significantly every month, however traffic during night time (2 AM - 4AM) and weekends still remains very low.

Implications:
This implies that any system maintenance should take place either Saturday and Sunday between 2 AM and 4 AM.

Reasoning:
In case something happens during the maintenance, the following day should cause as little distrubance as possible.
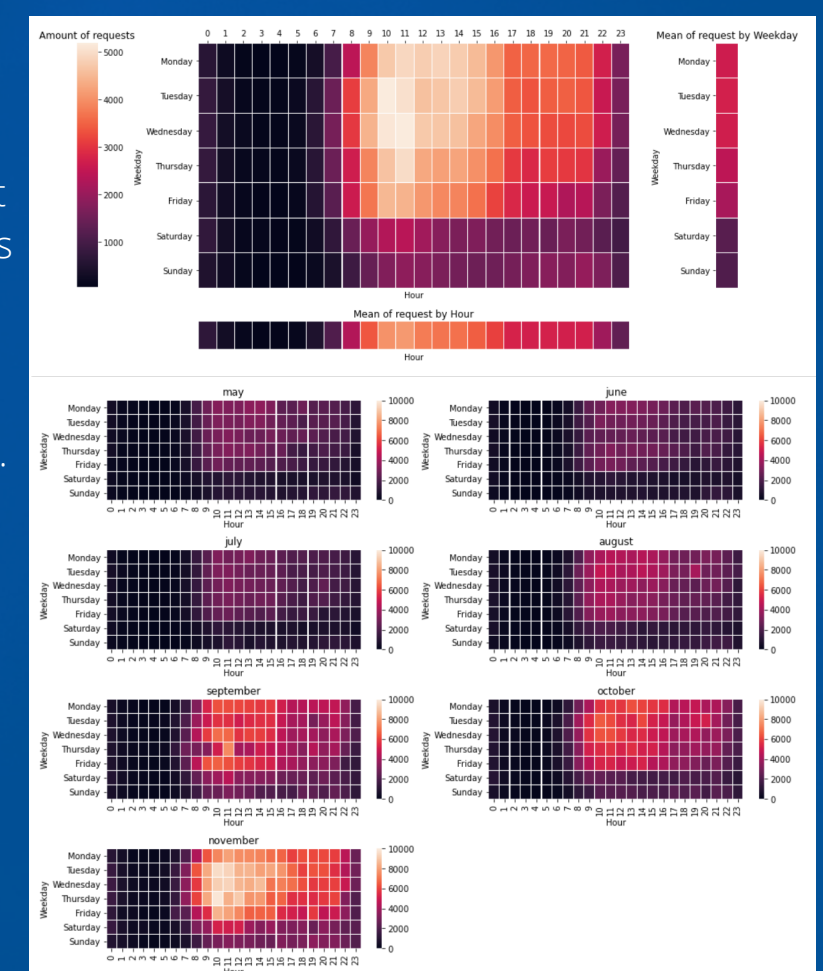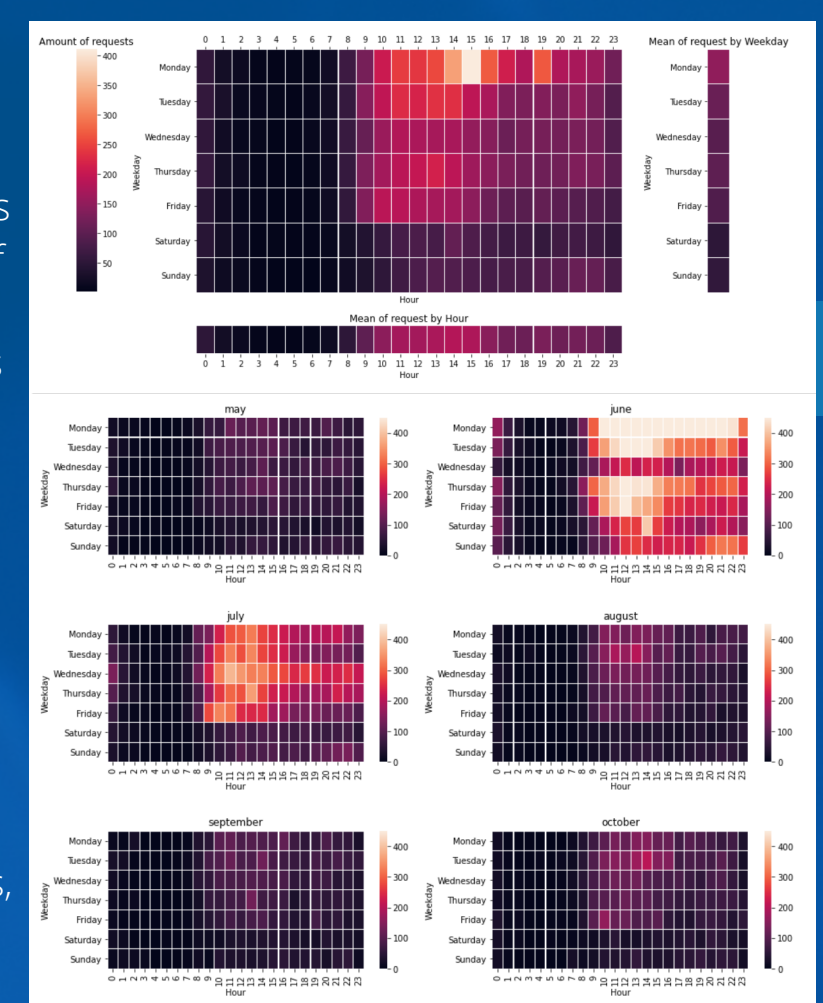

Exam infosystem
Observations: Observing queries to the exam infosystem we find that the system receives considerably higher amounts of traffic in June and July, most of which happens during business hours.

Implications:
This implies that any system maintenance should take place outside of June and July preferably during night time (1AM-5AM).

Reasoning:
As observed during finding correlations with real life events, the system experiences peak usage in June and July.

Appointing high-demand business hours

In order to plan maintenance times and support service usage adequately, a business owner has to know their true business hours. Since our goal is to find out the most optimal maintenance times, we must first establish peak usage periods. For that we used our datasets to construct a model that shows the percentage of traffic based on different potential business hour models.

	8-18/5	8-18/7	7-23/5	0-23/5	7-23/7	24/7
Request processed in %						
Exam Portal Data	55.21	63.99	80.24	83.84	95.27	100.00
Patient Portal Data	29.75	41.66	50.58	71.41	70.82	100.00

Conclusion

- Understanding and working with X-tee log data proved to be quite challenging, due to system complexity and widespread usage (1321 interfaced information systems!).
- Real life events have a significant effect on information systems.
- Information system data analysis provides input for making business and system maintenance related decisions.
- Depending on the system the coefficient of peak queries against potential users varies from 3-30 times based on our datasets.
- Being unprepared for external events related to the system can cause hiccups.

Acknowledgements

We would like to thank Tarmo Oja for providing the data and offering assistance in understanding how X-tee systems function.