

## OAKTeam Eindhoven University of Technology Travel Analysis Report.

### Summary:

In our opinion, there are no big problems in the process, but improvements can be made:

- system of payment of reimbursements, (more detail point 5);
- notification system about the need for approval (more detail point 5);
- logical control when entering declarations and data, because at the moment the system allows what it should not (more details 6, 9, 11, 12).

We have built our report in the form of answers to the questions, trying to deepen them in order to find new opportunities.

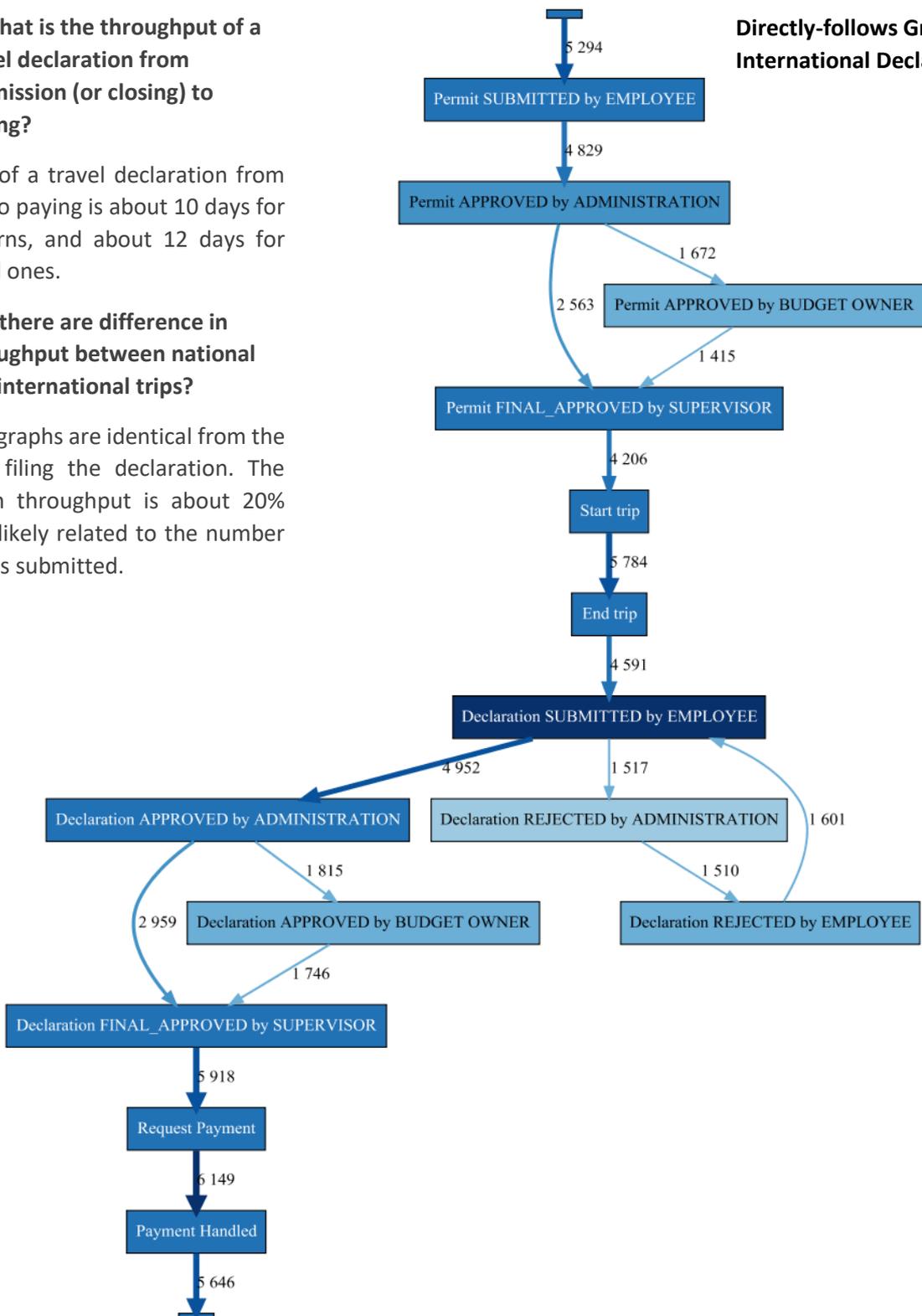
### 1. What is the throughput of a travel declaration from submission (or closing) to paying?

Throughput of a travel declaration from submission to paying is about 10 days for regular returns, and about 12 days for international ones.

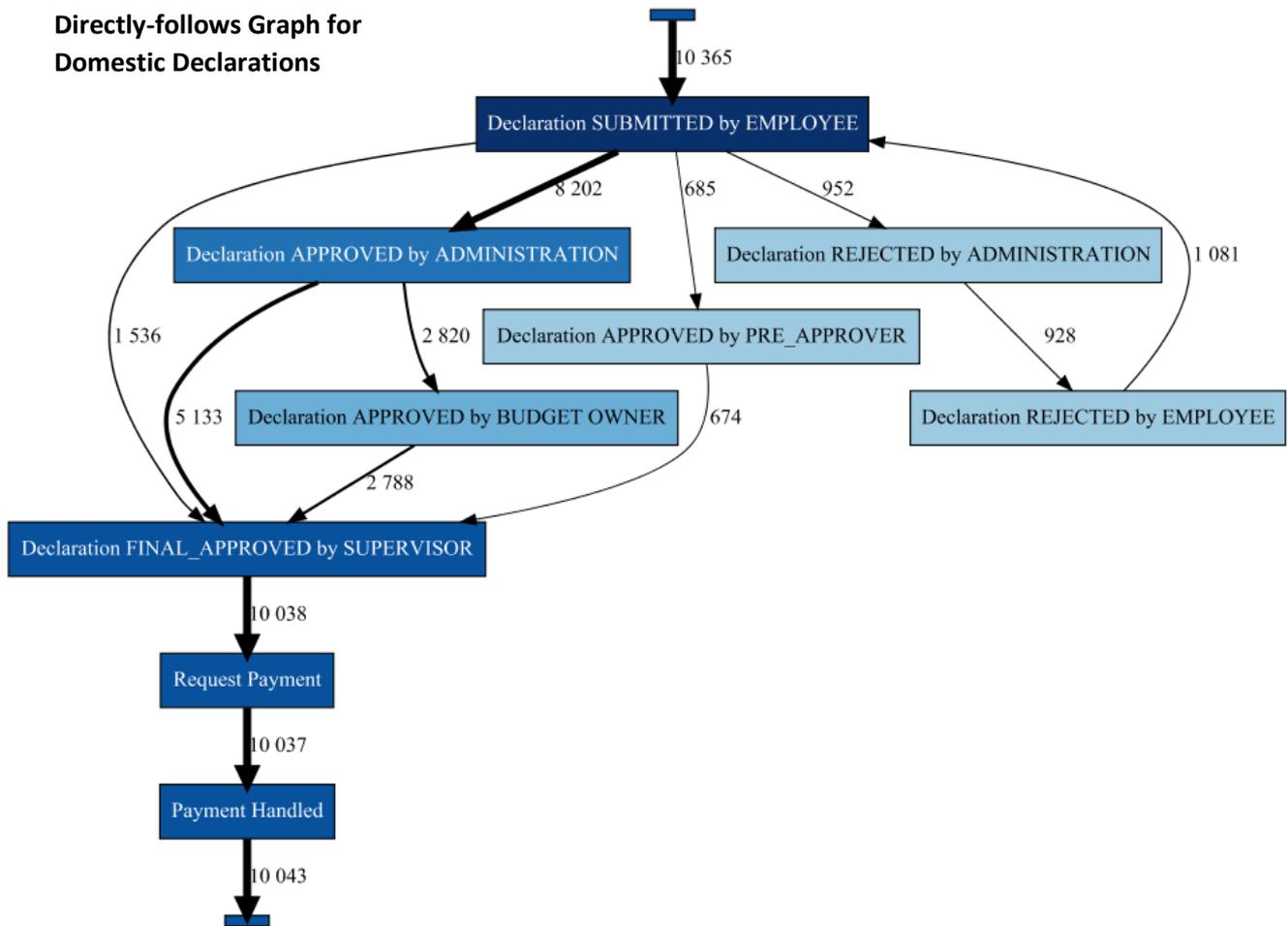
### 2. Is there are difference in throughput between national and international trips?

The process graphs are identical from the moment of filing the declaration. The difference in throughput is about 20% and is most likely related to the number of documents submitted.

**Directly-follows Graph for International Declarations**

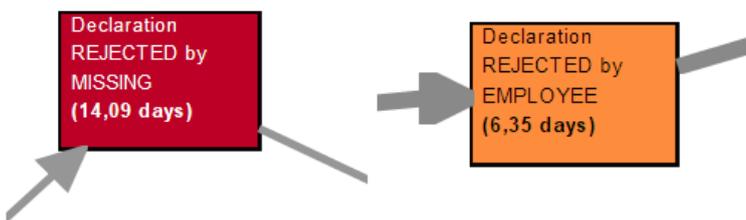


**Directly-follows Graph for Domestic Declarations**



- 3. Where are the bottlenecks in the process of a travel declaration?
- 4. Where are the bottlenecks in the process of a travel permit?

We have not identified any significant bottlenecks in the process. Stages similar to "bottlenecks" in transit time are rare and do not affect the entire process:



- 5. What is the throughput in each of the process steps, i.e. the submission, judgement by various responsible roles and payment?

The next longest stages are Request Payment and Payment Handled. The passage of the process at these stages takes approximately an equal amount of time, which can be optimized:



You can remove the "Request Payment" step and automatically assign a payment after the "FINAL\_APPROVED" step. If additional parameters are entered when requesting a payment, for example, an account for receiving a payment, they can be included in the declaration itself.

Also interesting is the possibility to reduce the approval time of declaration or permit, which on average go through 2.1-2.3 approval stages. There is no dependence of the number of approvals on the amount of the declaration. An example calculation for Domestic Declarations is given below. You can remove intermediate stages other than FINAL\_APPROVED for small amounts.

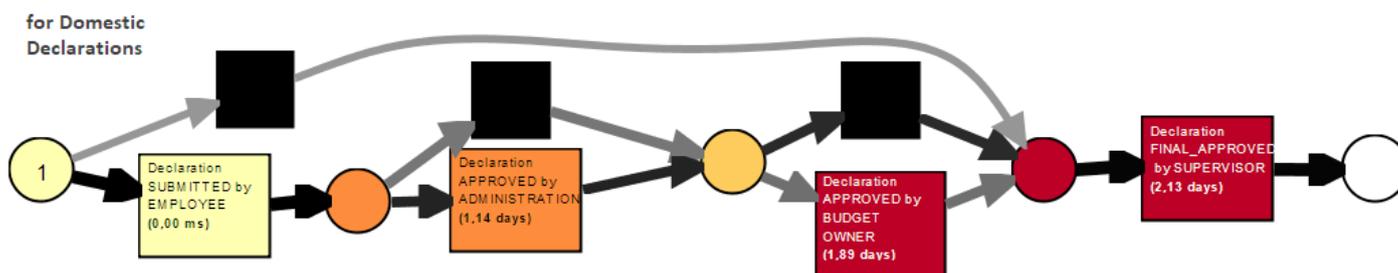
| Class by value | Count for case:Amount | Sum for case:Amount | Avg APPROVED steps |
|----------------|-----------------------|---------------------|--------------------|
| < 10           | 579                   | 3 879,14            | 2,14               |
| 10-20          | 1234                  | 19 067,31           | 2,11               |
| 20-50          | 3842                  | 128 608,59          | 2,14               |
| 50-100         | 2085                  | 144 605,20          | 2,19               |
| > 100          | 2304                  | 610 422,40          | 2,21               |
| <b>Sum</b>     | <b>10044</b>          | <b>906 582,64</b>   | <b>2,16</b>        |

Detailed allocation (for cases without rejected declarations):

| Class by value | NO APPROVER | 1 APPROVER | 2 APPROVERS | 3 APPROVERS |
|----------------|-------------|------------|-------------|-------------|
| < 10           |             | 112        | 265         | 168         |
| 10-20          |             | 221        | 616         | 308         |
| 20-50          |             | 514        | 2162        | 906         |
| 50-100         | 1*          | 237        | 1127        | 515         |
| > 100          |             | 308        | 1027        | 578         |

\* declaration 95149, is similar to manual correction - declaration "SAVED by EMPLOYEE", then paid.

On average, the approval time for one stage is from 1.5 to 2 days, it is impossible to estimate a lot or a little, without knowing the internal procedures, but we are sure that it can be improved. The average approval time increases with an increase in the level of the approving employee, for example, Domestic Declarations ranges from 1.14 to 2.13 at different stages. The average waiting time for "FINAL\_APPROVED by DIRECTOR" in the International Declarations process is almost 3 days. Perhaps this is due to the fact that junior employees may hesitate to disturb older ones in order to speed up the approval process.



We suggest analyzing and improving the notification system of the coordinating employees. Adding an impersonal procedure for sending repeated notifications to approvers can speed up the process.

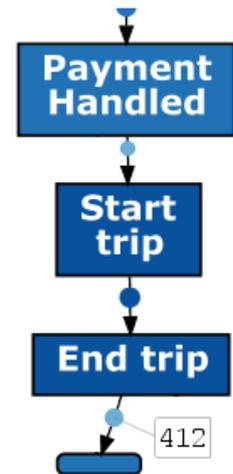
### 6. Are there differences between clusters of declarations, for example between cost centers/departments/projects etc.?

There is no information in Domestic Declarations that allows you to divide cases into clusters, the "BudgetNumber" field is filled with the value "budget 86566" for all.

The International Declarations contains the field "Permit OrganizationalEntity" on the basis of which the largest organizational units were identified in terms of the number of trips:

| organizational unit       | Case count |
|---------------------------|------------|
| organizational unit 65458 | 1432       |
| organizational unit 65455 | 1081       |
| organizational unit 65454 | 957        |
| organizational unit 65456 | 889        |
| organizational unit 65459 | 493        |
| organizational unit 65460 | 480        |
| organizational unit 65464 | 305        |
| organizational unit 65457 | 304        |
| organizational unit 65466 | 220        |
| organizational unit 65461 | 77         |

For organizational unit 65454



By analyzing the graphs, we were able to highlight that organizational unit 65454 is more likely to receive payments before travel dates (412 cases out of 957). A detailed analysis revealed that 402 declarations from the beginning of 2017 to April 2018 were entered with the same "travel permit number 424" and "task 427", while the travel dates are everywhere 10.04.2018 - 13.04.2018. We suggest paying attention to these cases.

**7. How many travel declarations get rejected in the various processing steps and how many are never approved?**

The logs of International Declarations and Domestic Declarations contain 16949 cases (100% of the declarations from the PermitLog are included here), of which:

- 16231 - paid;
- 509 - rejected;
- 205 - not sent for approval (only saved);
- 3 - rejected by the employee after approval;
- 1 - not completed, the last status is "FINAL\_APPROVED".

**8. How many travel declarations are booked on projects?**

4116 of International declarations are booked on projects, but Domestic Declarations cannot be determined by this.

**9. How many corrections have been made for declarations?**

Suppose that adjustments were made to those cases that were submitted twice or more, we get 1019 of 10500 (9,7%) cases for Domestic Declarations, 1405 of 6449 (21,8%) for International. It seems like filling out an International Declarations is much more difficult than Domestic. We suggest to finalize the instructions, primarily on International declarations or add reminders that appear when filling out/ sending the declarations. We also propose to think over logical control over the filling of declarations, for example, by the number of document, depending on the type of Declaration (if such requirements are regulated).

**10. Are there any double payments?**

There is not a single case where there have been 2 steps of «Payment Handled».

**11. Are there declarations that were not preceded properly by an approved travel permit? Or are there even declarations for which no permit exists?**

There are 427 International Declarations filed without prior approval, 426 of them paid.

**12. How many travel declarations are first rejected because they are submitted more than 2 months after the end of a trip and are then re-submitted?**

309 declarations were submitted later than 61 days after the indicated date of travel, 296 of them were paid. Probably the problem is the lack of control over the indicated travel dates, sometimes they are even earlier than the date of the travel request. Permission to travel on dates which have already past was requested 485 times, 469 cases were paid. Naturally, all cases refer to International Declarations.

**13. How many travel declarations are not approved by budget holders in time (7 days) and are then automatically rerouted to supervisors?**

We have installed 627 cases in which travel declarations are not approved by budget holders in time (7 days), and were reviewed by supervisor (approved or rejected). 388 for International Declarations, 239 for Domestic Declarations.

We did not find data to answer the following questions:

**How many travel declarations are submitted by the traveler and how many by a mandated person? Is this different between departments?**

**Next to travel declarations, there are also requests for payments. These are specific for non-TU/e employees. Are there any TU/e employees that submitted a request for payment instead of a travel declaration?**

We used Prom, pm4py, Excel to explore the data.

Thank you very much for organizing the competition and for the experience gained!