ANALYZING THE COMPLAINTS PROCESS AT GRANADA CITY COUNCIL

Summary

The city council of Granada was triggered to look at their dossier handling processes, because citizens had complained about delays. The administrative services group could identify time gaps where dossiers did not seem to advance, but they could not explain why these delays happened. Therefore, a process mining analysis was performed within the tax collection department of the Granada council. Because certain tasks were not registered in the IT system, the process mining analysis was combined with interviews of employees.

The results of this project changed the point of view of the managers in the department, who initially thought that the negligence of employees was the main cause of the delay. In reality, there were other factors such as a lack of staff rotation by incidents, and a lack of people with signing

- Lack of data made it necessary to combine process mining with interviews

- Results revealed unexpected organizational root causes

- New traceability makes it possible that municipality can now respond to citizen requests about status

responsibilities whose rotation or absence was not covered, which influenced the delays. Due to this project, the organization has gained traceability and deadlines control, which results in benefits for citizens, public employees, and politicians.

Company

Granada is a city with a population of 250,000 people in the South of Spain. The analysis was performed on one of the processes performed by the Municipal or Local Tax Agency, which acts as an agency with its own competencies for tax management and collection in the city of Granada.

Local Tax Agency

Granada Town Hall, main building

Another branches offering public services
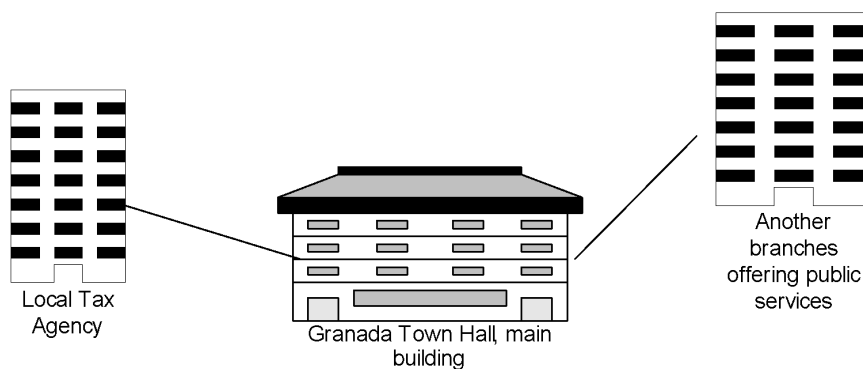
Process

The target of analysis was the appeals and complaints process about the collection of taxes and other public revenue. For example, when a citizen does not agree with a tax collection statement they can register a claim, which then starts the appeal and complaints process. They receive a response to their claim at the end of the appeal and complaints process. Because citizens had to wait a long time for their response, they started to complain to the city council about these delays.

> ## "We were able to find points of improvement that employees and managers could not find through their intuition."
>
> *—ARTURO MARTÍNEZ ESCOBAR, AYUNTAMIENTO DE GRANADA-AGENCIA MUNICIPAL TRIBUTARIA*

In fact, delays in the appeals and complaints process are not just a performance problem, but they are also a compliance problem: There are legal deadlines, and it is a legal obligation for the council to expedite dossiers ex officio in order to meet these deadlines.

After receiving complaints about these delays, manual inspections of individual dossiers confirmed that there were indeed requests that were not advanced in a timely manner. However, officials were not able to tell whether this was a common problem and they could not explain why these delays occurred.

The appeals and complaints process starts when a claim is

registered in one of three places: (1) Electronically via the General Registry office in the City, (2) in person at one of the General Registry offices, or (3) at the registry of the Local Tax Agency.
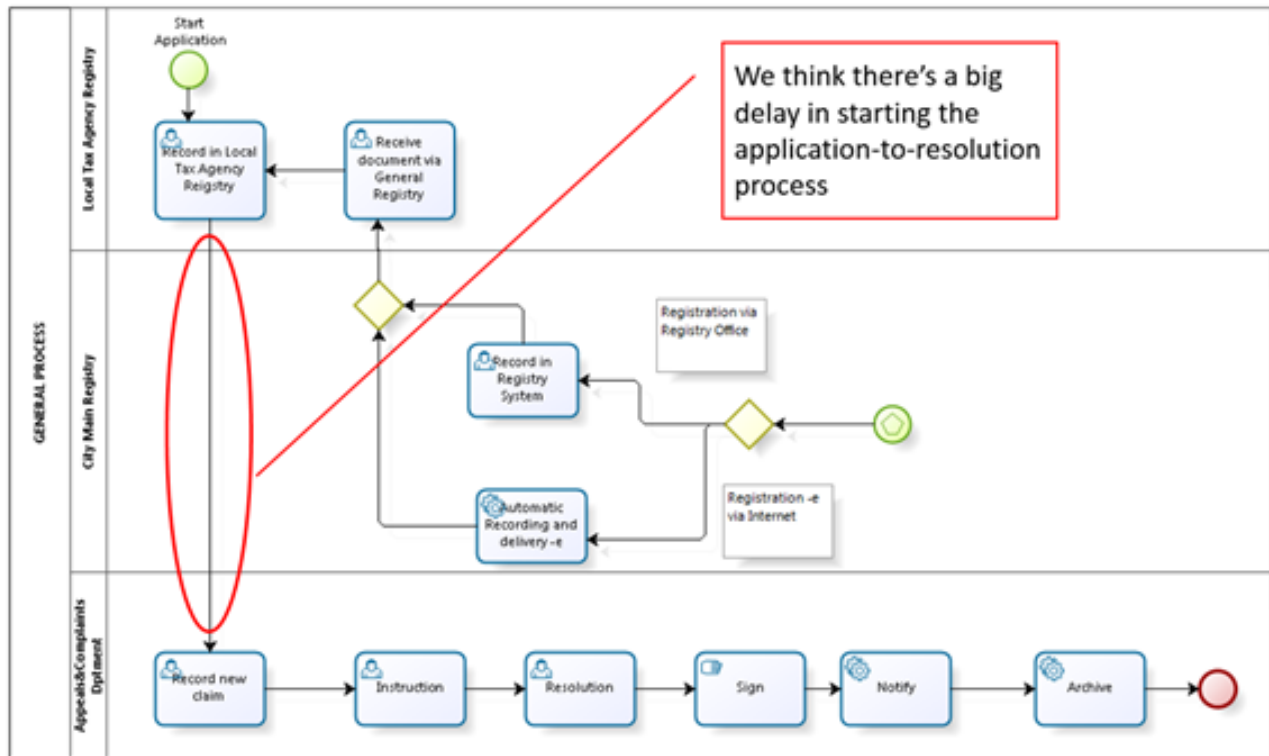
Once the application is registered at the General Registry office (see middle lane in the above picture), it must be received by the registry of the Local Tax Agency (see upper lane in the above picture) and subsequently be delivered to the Appeals and Complaints department (see lower lane in the picture above), which is responsible for the resolution of these appeals. If the application is recorded directly at the Local Tax Agency, a note is created by collateral effect on the overall check to maintain traceability of the record. After the physical arrival of all documents regarding the application, the applications are delivered to the Appeals Complaints department.

Based on the manual inspections, we suspected that most of the delays were in starting the application to resolution process (see area highlighted in red above).

Data

To find data for the process mining analysis, we checked the repositories such as the dossier database for records related to the activities in the process. We found that each application was written into a dossier row with information in a similar format. We also saw that the electronic registrations and the Registry Office IT system share the same database, and that each electronic registration description appeared with the suffix "-e" (which made it possible to distinguish electronic registrations from in person registrations).

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While thee dossier database was shared, different tables were used for registering information at the different departments. This means that data from these different tables had to be combined to create a data set that can be used to analyze the full end-to-end process. The data contained a dossier ID, which could serve as the case ID. Furthermore, information about what was done (activity), who performed the process step (employee), and timestamps about the start of each step were available.

The main challenge was the re-creation of the dossier history from its beginning. The IT software applications that support the processes are all integrated within the municipal information system. However, they often use different field names regarding the same record across different tables. Furthermore, we had to clarify the actual meaning of each field in the database to identify exactly which records correspond to the citizen's original appeal and which records correspond to new records created afterwards (indicating steps in the process).

To complicate things even more, although there was a dossier ID that could be used as a case ID, each application creates a new dossier ID to manage a new claim. The new dossier ID is different from the management dossier that motivated the citizen complaint (i.e., the original claim). Therefore, for each dossier ID there should exist a reference dossier ID or a dossier proceedings ID, which must be traced and correlated to create the full end-to-end data set.
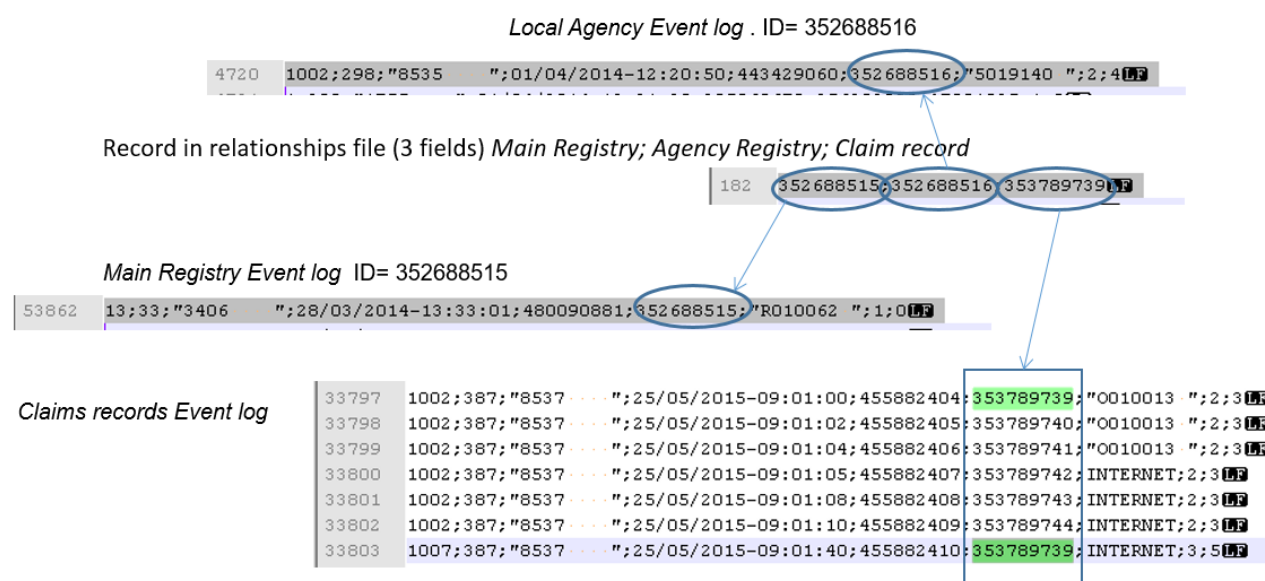
We solved this challenge by extracting the dossier ID relationships (see figure above) between the three tables from the Local agency event log, the main registry event log and the claims records event log. The dossier ID from claims records event log was then used as the overall case ID for the data set.

We had to pay extra attention due to the different ways that the process can be started: Some dossiers had to be traced through two registries (if started at the General Registry office) while others went through only one (if launched directly at the Local Tax Agency). Furthermore, the

11			
12	333653156	356835510	71778728
13	352402555	352402556	353789781
14	0	338239820	48321257
15	333657048	333657049	353789584
16	333653156	356835510	71778728
17	341498908	356835509	71778782
18	356587108	356835508	71778778
19	333658065	333658066	353789683
20	352676721	352676722	353789791
21	352676725	352676726	353789669
22	352676727	352676728	353789838
23	352676753	352676754	71778751
24	0	236451616	353787835
25	333657048	333657049	353789584

claim dossier ID is only created when it reaches the resources processing unit. However, its history starts earlier (passing through a database record or two before). Therefore, the claim dossier ID had to be filled in retroactively for these earlier events.

J TRAMITES_TERMINAL	K ESTADO_IN	L ESTADO_OUT	M Activity
5019140	2	4	REG. AGENCIA: ANOTACION DE DOCUMENTOS VIA REGISTRO GENERAL
A131065	2	2	DEPT.RECURSOS: Asignar Lote AMT (efc)
A131065	2	3	DEPT.RECURSOS: Emisión informe propuesta masiva
<notty>	5	2	DEPT.RECURSOS: Pasar a Instruccion (efc)
INTERNET	3	5	DEPT.RECURSOS: Emision Anexo Propuesta masiva
INTERNET	3	5	DEPT.RECURSOS: Emision Anexo Propuesta masiva
A131065	2	3	DEPT.RECURSOS: Emisión informe propuesta masiva
<notty>	5	2	DEPT.RECURSOS: Pasar a Instruccion (efc)
<notty>	6	7	DEPT.RECURSOS: Verificar notificacion de la Resolucion (efc)
5019134	6	6	DEPT.RECURSOS: Generar Remesa (efc)
INTERNET	2	3	DEPT.RECURSOS: Emisión informe propuesta masiva

Finally, an additional challenge emerged from the fact that the activity names were not in a readable form. A combination of three fields of numerical values and attributes had to be mapped to a human-readable label that indicated the activity that was performed in a meaningful way (see the table above for an excerpt).

After all these data preparations, we had created a CSV file with a total of 7,582 events and 2,511 cases for our process mining analysis.

Results

We imported the data set in the process mining software Disco to discover the process that was performed for these 2,511 cases.

In the discovered process (see the process map to the right, which is based on the Total duration visualization), we could clearly see one major bottleneck, which has had the biggest impact on the delays. This confirmed our hypothesis from the manual inspections: There is a big delay before the application-to-resolution process is started in the Appeals and Claims department. We also saw that this was a general problem and not limited to a few exceptional claims.

We then filtered the data set down to just the claim creation events and the
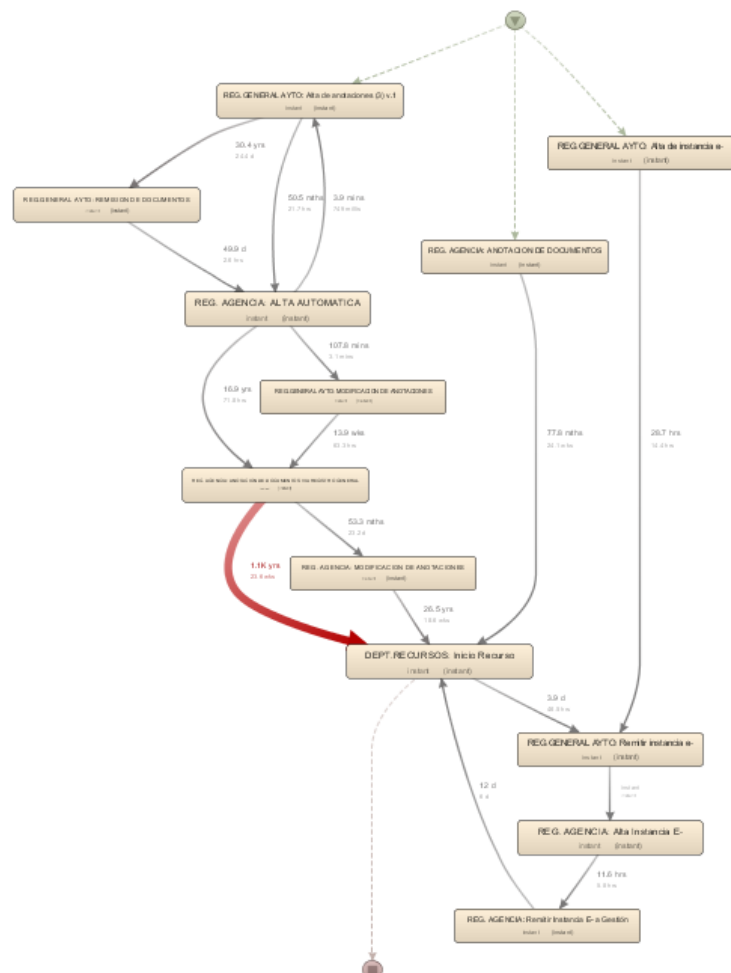
start of the process in the Appeals and Claims claims department (see process map below). Certainly, 23.6 weeks, 18.6 weeks and 24.1 weeks on average to pass the registration processing does not look normal.
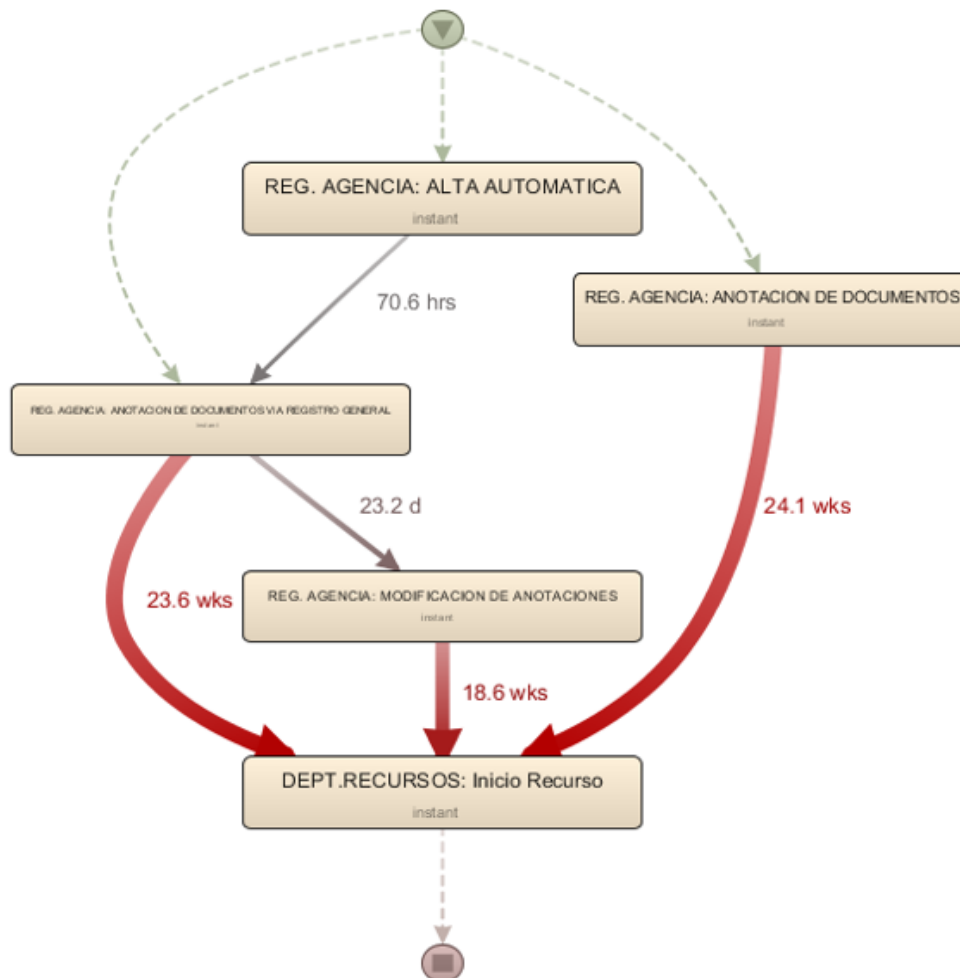
We then further analyzed the data set using the Dotted Chart plugin in ProM (see visualization on the next page). The dotted chart plots each case in a horizontal line as a sequence of dots. Each dot represents one process step that was performed. The y-axis represents the time frame of the data set from March 2014 until September 2015.

From this visualization we can observe two things:

1. There are areas in the timeline, where much less activity is shown than in other time periods. What happened there? Was the process stopped? Why?

2. The vertical patterns of dots indicate that many activities were performed for different cases nearly
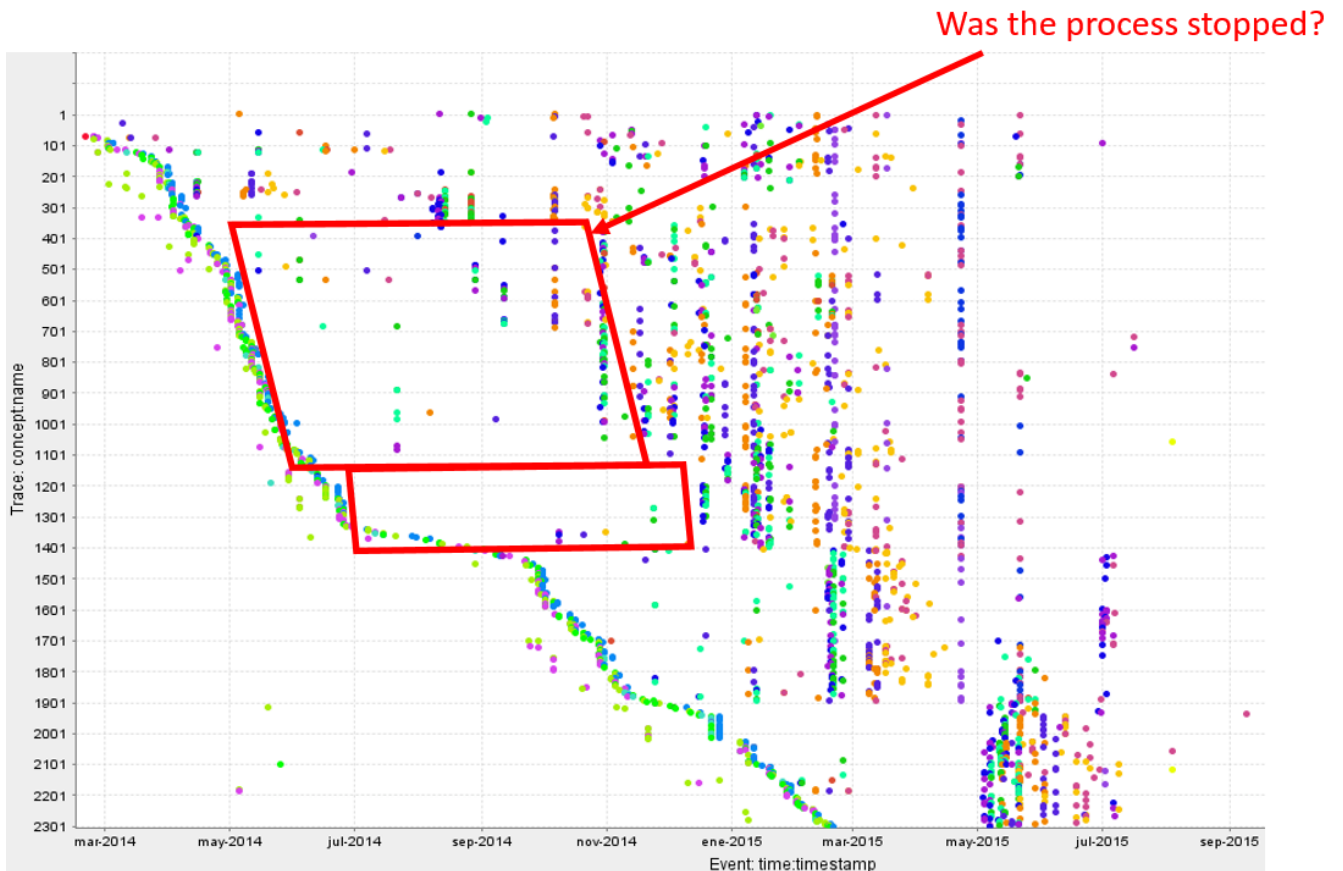
As a next step, we had to find out what happened in those periods of inactivity in the process. Were these claims suspended or pending for some reason? Because there was no record in the data about what happened at that time, we performed interviews with employees working in the process to identify the root causes.

During these interviews we learned that:

- The claims are handled manually and need to be physically classified once they get from the registration to the Appeals and Complaints department.

- The classification task is in turn broken down into several manual activities. This classification step is very important for the performance of the process, because once the claim is cataloged it is further processed in batch. The classification is done by a knowledge worker who judges and sorts the claims based on the decision to be made (rejecting or approving the claim).

  Because these classification tasks are manual activities, no data about how long it takes to organize and classify the records, nor about the role that the resource plays in this part of the process, is recorded.

- Finally, we also learned that information that was already recorded in the computer system (for example, the citizen's address) had to be re-registered manually. In addition to the extra work involved, this can generates redundant information and creates a potential for errors or inconsistencies.

We realized that — because they were not visible in the system — there was not enough awareness about the importance of these classification tasks. The feeling at the municipality was that the delays could be the fault of the employees. The employees were not recognized for their work on this highly specialized and important task.

Furthermore, it was now clear that the speed of the process could be improved by adding employees who would perform the manual re-registration tasks in the system until the data transfer was properly automated. This way, the knowledge workers would not have to spend time on these basic data entry tasks anymore.

In addition, we learned that there were also improvement possibilities in the resource organization: Particular people were responsible for signing the dossiers. When they were not available, for example, due to illnesses or vacation, then delays could occur. By ensuring a capacity to cover cases in situations of absence, delays in the dossier handling progress could be avoided.
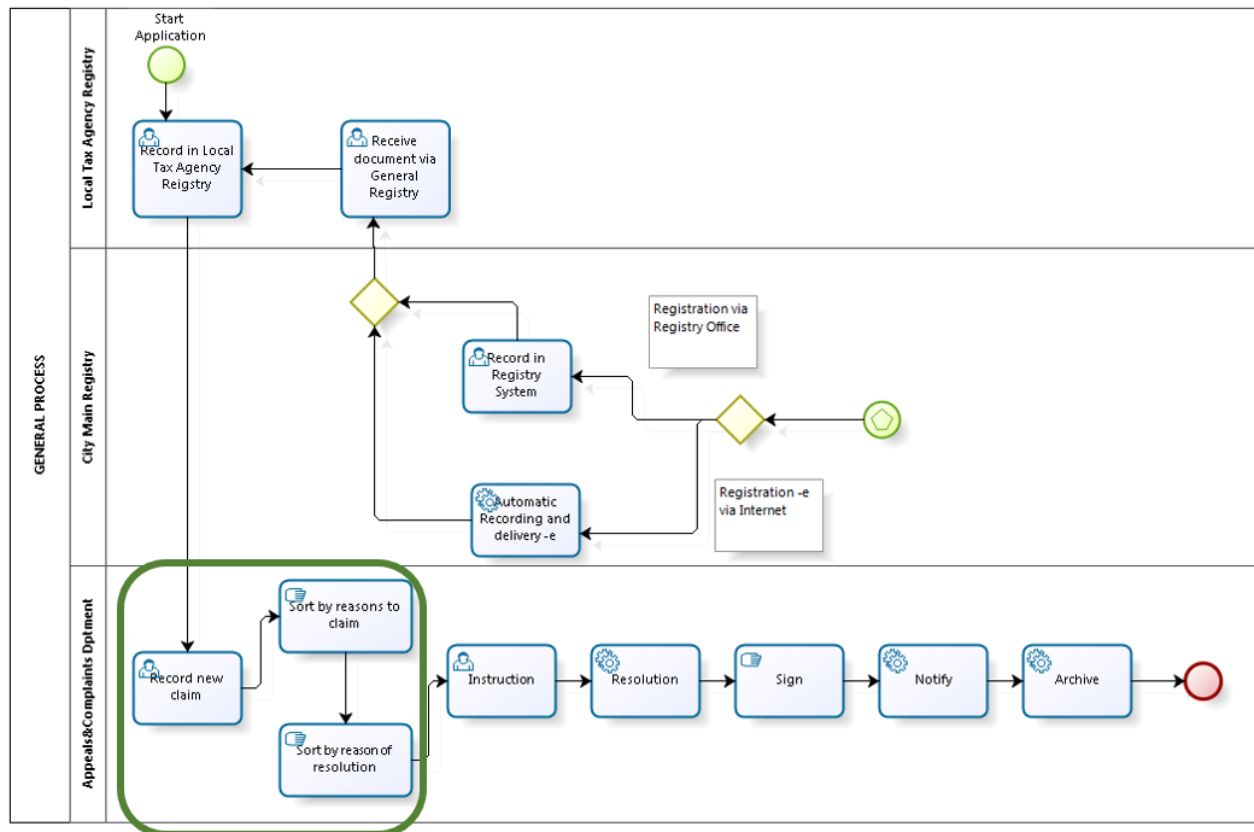
> **"The work environment has improved and the efforts of the employees handling the classification are now much more valued than before."**
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Impact

Based on our analysis, we made the following recommendations:

- Avoid the manual re-entry of data by automating the data transfer from the source system. In the meantime, assign additional resources to help with the manual data entry to reduce the work load in the manual classification task.

- Automatically transfer claims to the Appeals and Complaints department once they are ready and create two new, manual activities in the process, where the resources can keep track of the manual activities (see illustration of the new process with the new steps highlighted in green on the next page). This will provide a greater transparency and better accountability for the manual — and currently invisible — steps in the process.

- Create a system in which authorized officers are appointed to sign the resolution of cases in situations of absence, so that the processing of the department is not halted by this absence.

As a result of these changes, we have now achieved the following improvements:

- The workloads and planning can now be measured. This was not possible before. In addition, we can now provide more realistic responses to citizens about the progress (and expected completion) of their dossiers.

- We could show that the problems in the process were not due to official neglect. Instead, there was a lack of traceability in the computer systems, because of a lack of alignment with the reality of the business process. The work environment has improved and the efforts of the employees handling the classification are now much more valued than before.

- Given that the data preparation steps are now in place and can be easily repeated on new data, we can now continue to analyze and quantify this process to continuously improve it. We can even use these measurements to simulate what potential process improvements we can expect by adding more employees to certain tasks. This way, we can continue to resolve bottlenecks and reduce the average time of initiating and handling the complaints after being classified.

- Finally, the improved records management is also very important from a compliance perspective, because we can ensure and prove that our process is aligned with the rules.

Process mining was totally unknown for the management of the organization as well as their technical staff. They have been impressed with the graphical power of representing the process flows and annotating the model with performance metrics. Frequent activities could be made visible and the results were easy to interpret.

Previously, the logs from the IT systems were only used for the purpose of occasional checks triggered by inquiries from citizens. The transaction records were never used to visualize, analyze or audit the process in a systematic way before. We have found that process mining can significantly help to improve administrative processes in our government agency, and we believe that this method is extensible beyond the department of resources and claims collection. For example, areas where we will explore process mining in the future are the social services processes, subsidies, tax collection and management, sports concession fees and licenses, etc.

We have learned that the exploratory analysis of the business process through process mining can reveal issues of concern that are unknown, and that it can impact the performance of the organization and performance of their employees. We have also seen that not all process activities are always captured in the system records. Therefore, it is good to sit down with the responsible users in an interview in addition to the process mining analysis to complete the picture. This can also help to uncover additional factors that influence the process, which are often not visible in the data.

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