Process analysis - Team project for PV207

IT Support - Customer Care

Team:

- Pavol Loffay: Teamleader, Business analyst, Process analyst, Developer
- Milan Pánik: Business analyst, Process analyst, Developer
- Jan Faron: Business analyst, Process analyst, Developer
- Martin Pitoňák: Business analyst, Process analyst, Developer

Organisation overview

Customer Care company provides support for several applications, tools and services. Customers can create tickets which are then solved by our employees. Company also offers access to first class comprehensive knowledge base. Customers can subscribe for several subscription levels. These levels affects priorities of the customer's issues. Number of supported application each year grows, therefore the company would like to be the biggest support provider in the world.

Vision

Make the world without unsolved technical questions.

Mission

Build the largest technical knowledge base which can answer any technically related question in targeted domain and in parallel provide real time answers from experts. Whereas all this features are available 24/7 to the customers.

Goals and objectives

Goals, objectives and related KPI/KRI/PI/RI are listed in the following section:

- G:Solve every business case reported by customer.
  - O: Solve 90% of the critical business cases in 78 hours.
    - KRI: N% of critical business cases solved in 78 hours.
    - KPI: Average time to solve critical business case.
  - O: Solve 80% of normal business cases in 78 hours.
    - KRI/KPI same as previous.
  - O: Solve 98% of all business cases in one month.
    - KRI/KPI same as previous.
- G: Provide the most comprehensive first-class knowledge base in targeted domain.
  - O: Knowledge base contains 80% of asked business cases measured monthly.
    - KRI: N% of business cases solved directly with knowledge base during current month.
    - KPI: N% of business cases solved directly with knowledge base during current day.
  - O: 80% of the business cases which do not have solution in knowledge base are added to knowledge base within one week.
    - RI: N% of solutions of business cases added to knowledge base weekly.

    - O: Add 10 solutions to knowledge base every week.
        - KPI/KRI: Number of added solutions weekly.
    - O: Add support to at least one new product/tool/service each quarter.
        - KRI: Number of added products/tools/services each quarter.
        - KPI: How many products/tools.. are in adding process.
- G:Be the major provider in IT support field.
    - O: Increase customer base by 10% each month.
        - KPI: Number of new customers each month.
        - KRI: N% of new customers.
- G: Satisfied customers.
    - O: 80% of the customers who renew subscription each month.
        - KRI: N% of customers with renewed subscription each month.
        - KPI: N of paying customers.
    - O: At least 10% of new customers are from referral program each month.
        - KPI: N% of new customers from referral program.

Measurement indicators

Measurement indicators for earch objective and related goals are listed in the previous section.

Organisation structure

Roles and respornsibilities

- L1 Support Operator: operator who is only capable of solving issues with klowledge base.
- L2 Support Operator: technically skilled operator
- Translator: responsible for translating issues.
- Manager: He is responsible for choosing tools to support and for coordinating operators.
- Director/Leader: Director monitors the whole organization and is responsible for the whole company. He mantains the vision and mission and discovers new opportunities.

Departments

- Support department: L1 and L2 support operators are sitting close in order to be more efficient in solving business tasks and knowledge transfer.
- Translation department: It is located close to support department so that operators can easily reach translators.

Processes

- Customer registration
- Create ticket
    - Solve business case
    - Validate business case and subscription
- Add support for new tool
- Add item to knowledge base

- Create/Update subscription
- Account Employees
- Generate Reports

Customer Registration - G: company growth, G: Satisfied customers [Pavol Loffay]

Description

Customer registration is important process by which organization can determine its growing and possibly other goals.

Customer fills the registration form e.g. name, surname, email. Email is sent to service's REST endpoint where is validated then it is stored to the customer storage (in our case in memory objects). Email validation is done by external REST service. It is because it
also checks is the email is not from vulnerable domain etc. Then if the customer already exists email is sent back to the customer and process ends. Process waits one minute for incoming payment and if time exceeds user is removed from the database.

Indicators

- Number of new customers each month.
  - Integer
  - 1000 [500]
- N% of new customers related to previous month.
  - % [currentMonth/previousMonth * 100]
  - 120% [100%]

Roles

- Customer
  - Fills the registration form.

- System
  - Realize the registration.

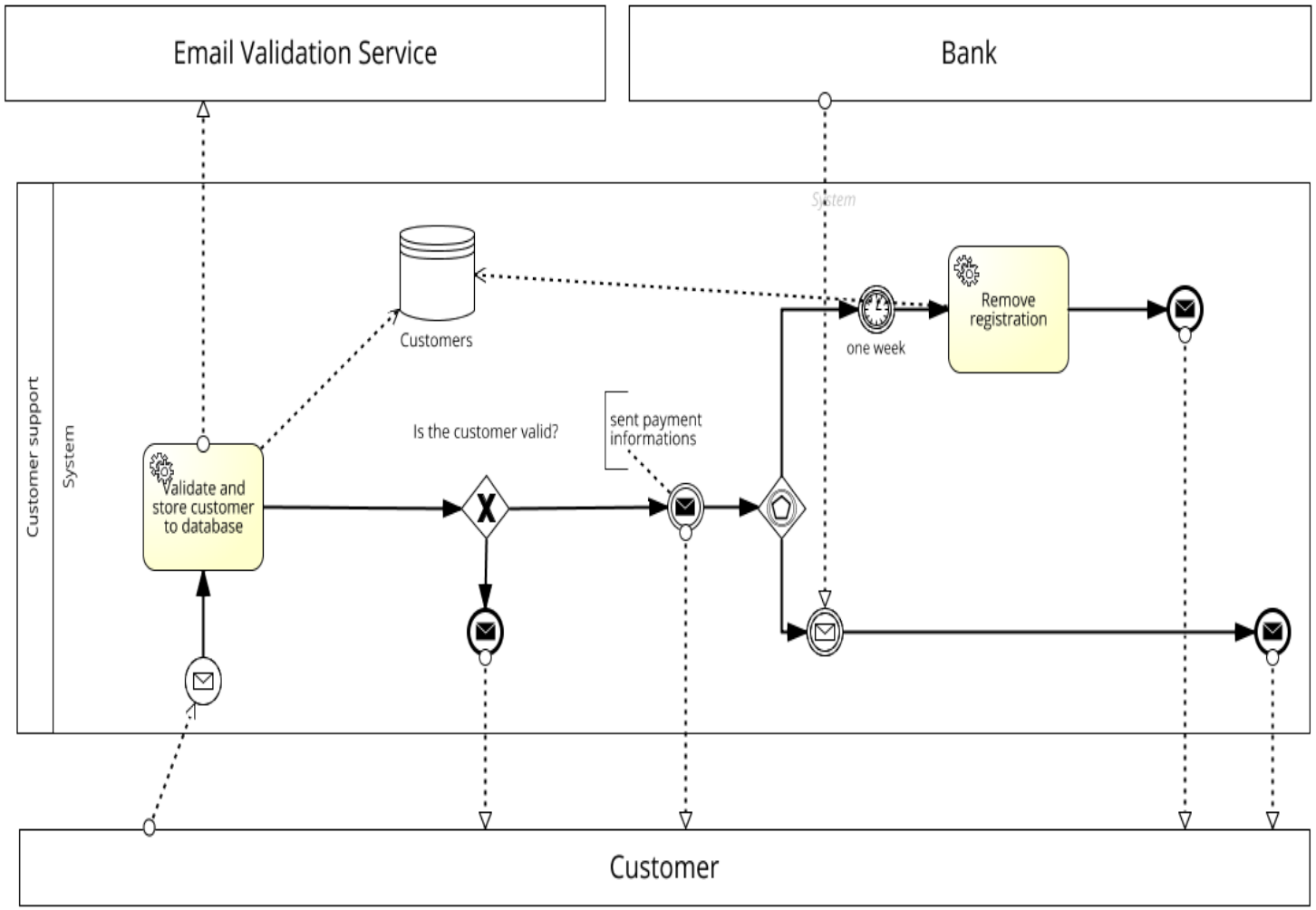
- Bank
  - Sends message about payment.

Data objects

- Customer storage
  - storage where are stored all customers

Services

- Email Validation


Email Validation Service
Bank
Customer support
System
Customers
Validate and store customer to database
Is the customer valid?
sent payment informations
one week
Remove registration
Customer

Create Ticket - G: satified customers, G: solve every business case reported by customers, G: provide the most comprehensive first-class knowledge base in targeted domain [Pavol Loffay]

Description

The Create Ticket process is main process in our organization. High level idea is that customers sends their issues to our system (internally represented as business case) and our operators solve them with or without help of our kowlege base. The process also checks if the business case is spam. Then it validates and stores the ticket in separate subprocess. Then the ticket is solved in separate subprocess. With this modular approach we can easily change underlying subprocesses.

Indicators

- N% of business (for each group: critical, normal) cases solved in 78 hours.
- Average time to solvel business case (for each group: critical, normal).

Roles

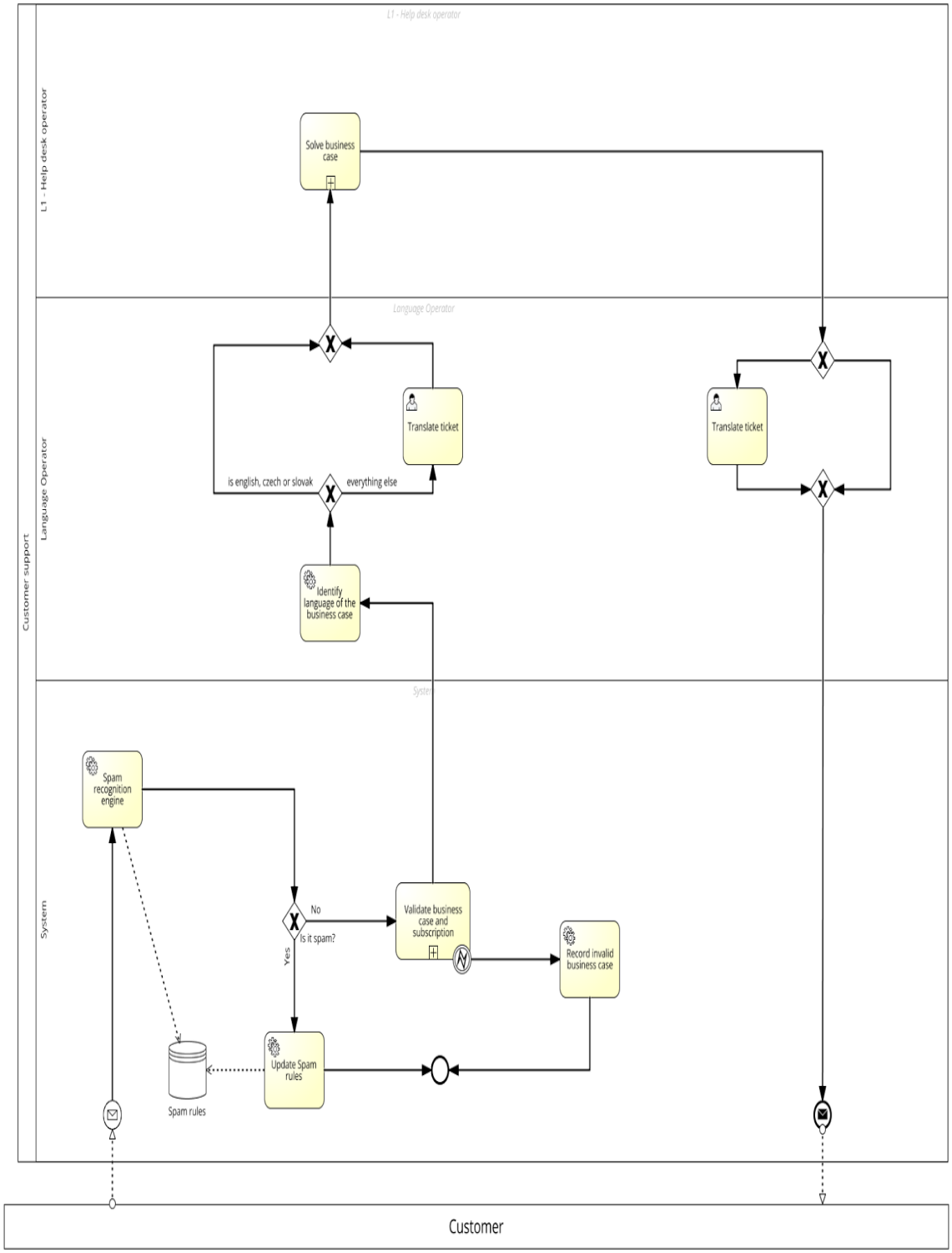
- Customer
  - Opens business case/ticket.
- System
  - Realize the registration.
- Translators
  - If necessary translates business case
- Customer care operators
  - Level 1, 2 operators which solve business case

Data objects

- Spam storage
  - storage where are stored records for spam filtering purposes

Service

- Spam recognition


L1 - Help desk operator
Solve business case
Language Operator
Translate ticket
is english, czech or slovak
everything else
Identify language of the business case
Translate ticket
System
Spam recognition engine
No
Is it spam?
Yes
Validate business case and subscription
Record invalid business case
Update Spam rules
Spam rules
Customer support
L1 - Help desk operator
Language Operator
System
Customer

Validate business case and subscription - G: satisfied customers, G: solve every business case reported by customer [Milan Pánik]

Description

Once the ticket (business case) is filled by the customer, the system verifies customer's subscription. If the subscription is not valid, the customer is notified about the problem and encouraged to refresh the subscription. Otherwise the business case cannot proceed any further. If the subscription is valid, one can have premium or default (normal) subscription level support. In case of premium, the customer's business cases recieves higher importance and priority in our company. Premium customers are notified and can watch status of their business case. Our employees can alter the priority based on our knowledge about the problem, customer situation and subscription type.

Indicators

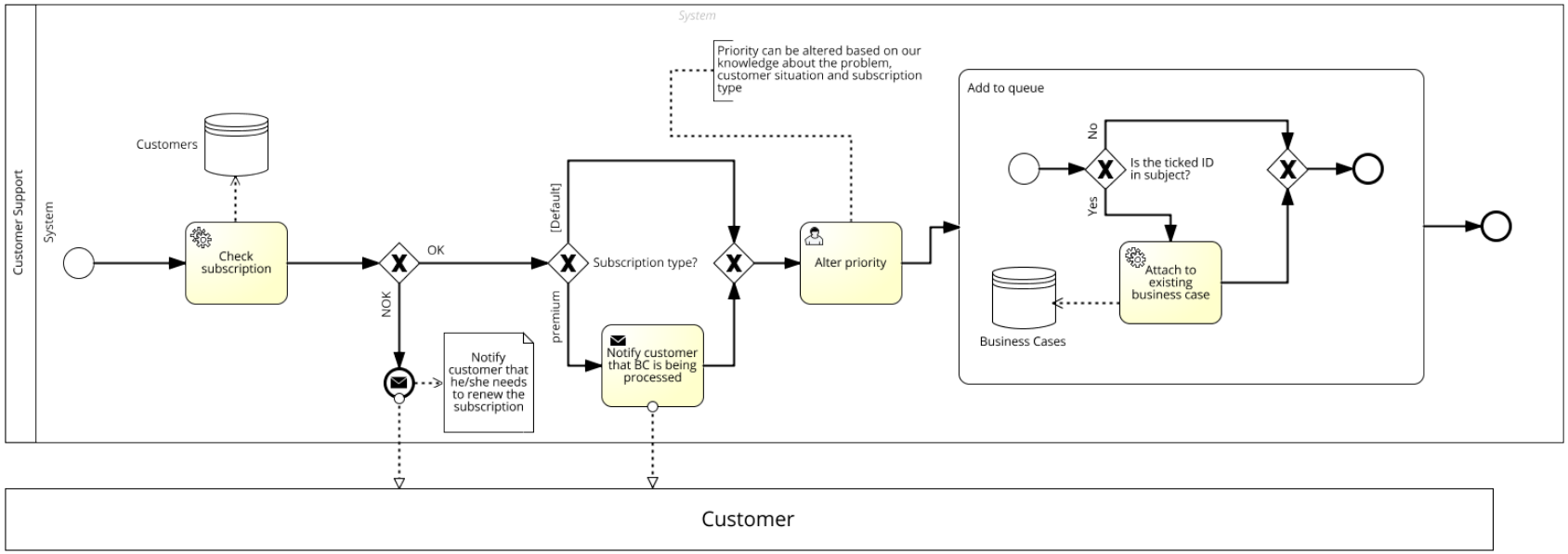
- Number of new business cases opened each month.
- N% of customers that have valid subscription

Roles

- Customer
  - Is informed if needed
- System
  - Handles the customer's newly created business case

Data objects

- Customer storage
  - storage where are stored all customers
- Business cases storage
  - storage where are stored all business cases


System
Customer Support
System
Customers
Check subscription
OK
NOK
Notify customer that he/she needs to renew the subscription
[Default]
Subscription type?
premium
Notify customer that BC is being processed
Priority can be altered based on our knowledge about the problem, customer situation and subscription type
Alter priority
Add to queue
No
Is the ticked ID in subject?
Yes
Attach to existing business case
Business Cases
Customer

Account the employees - G: Solve every business case reported by customer, G: satisfied customers [Milan Pánik]

Description

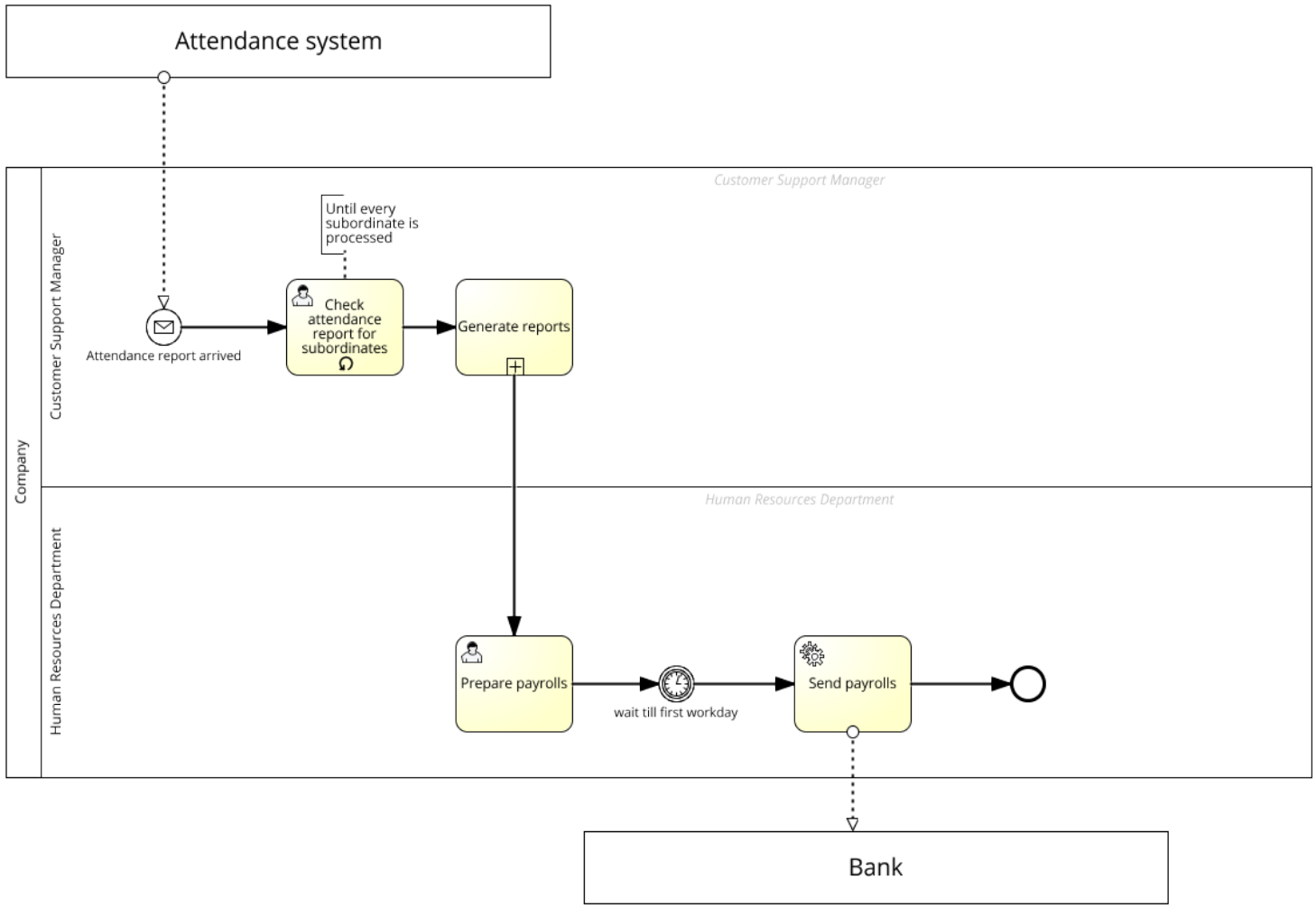
Accounting process is vital part of our organization. Without the accounting process, the employees would not get payrolls. During the accounting process, the reports are generated as well.

Indicators

- N% of new opened business cases were solved
- N% of all business cases were solved

Roles

- Attendance System
  - Provides attendance records
- Bank
  - Executes paycheck commands


Attendance system
Company
Customer Support Manager
Customer Support Manager
Until every subordinate is processed
Attendance report arrived
Check attendance report for subordinates
Generate reports
Human Resources Department
Human Resources Department
Prepare payrolls
wait till first workday
Send payrolls
Bank

Generate reports - G: satisfied customers, G: solve every business case reported by customer. [Milan Pánik]

Description

During the accounting, the customer support manager can generate reports. Reports are necessary to interpret the statistical information. Some of the reports are send to premium subscribed customers.

Indicators

- N% of business cases solved in month.
- Average time to solve business case in month.

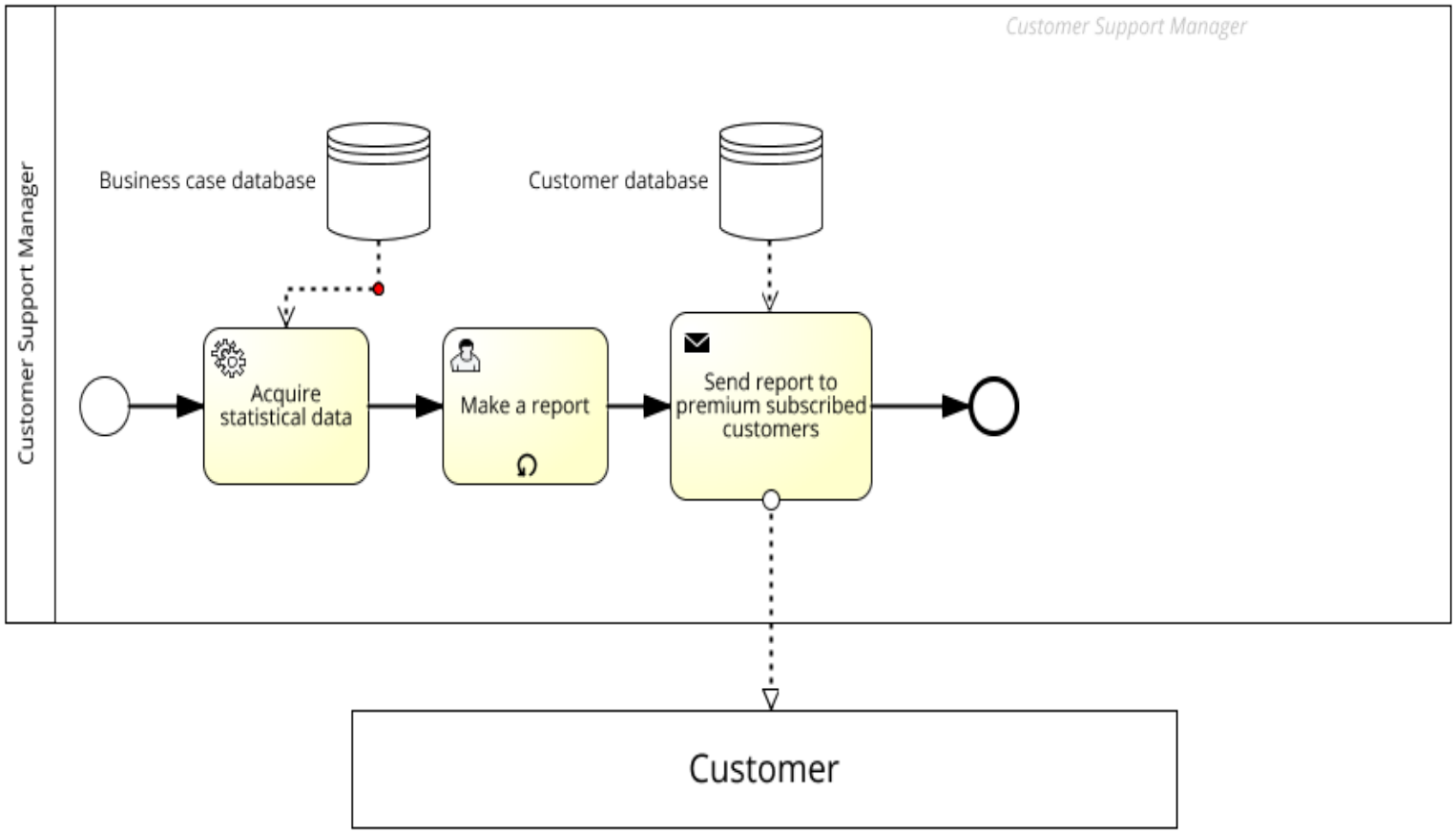
Roles

- Customer
  - Premium customer recieves reports

- Customer Support Manager
  - Prepares reports

Data objects

- Customer storage
  - storage where are stored all customers
- Business cases storage
  - storage where are stored all business cases


Customer Support Manager
Customer Support Manager
Business case database
Customer database
Acquire statistical data
Make a report
Send report to premium subscribed customers
Customer

Add support for new tool - G: Provide the most comprehensive first-class knowledge base in targeted domain. [Jan Faron]

Description

This process add new supported tool to our portfolio. Manager of our knowledge base identify appropriate tool, that we don´t support yet base on trends and analysis of our business case storage and knowledge base. He identifies main problems of this tool, that we should cover by our knowledge base. Then L2 engineer sequentially prepares and tests solutions to each identified problems. Prepared solutions are added to knowledge base in sepparate subprocess. After all main problems are covered by knowledge base, Manager officialy add new tool to our portfolio.

Indicators

- KRI: Number of added products/tools/services each quarter.
- KPI: How many products/tools.. are in adding process.

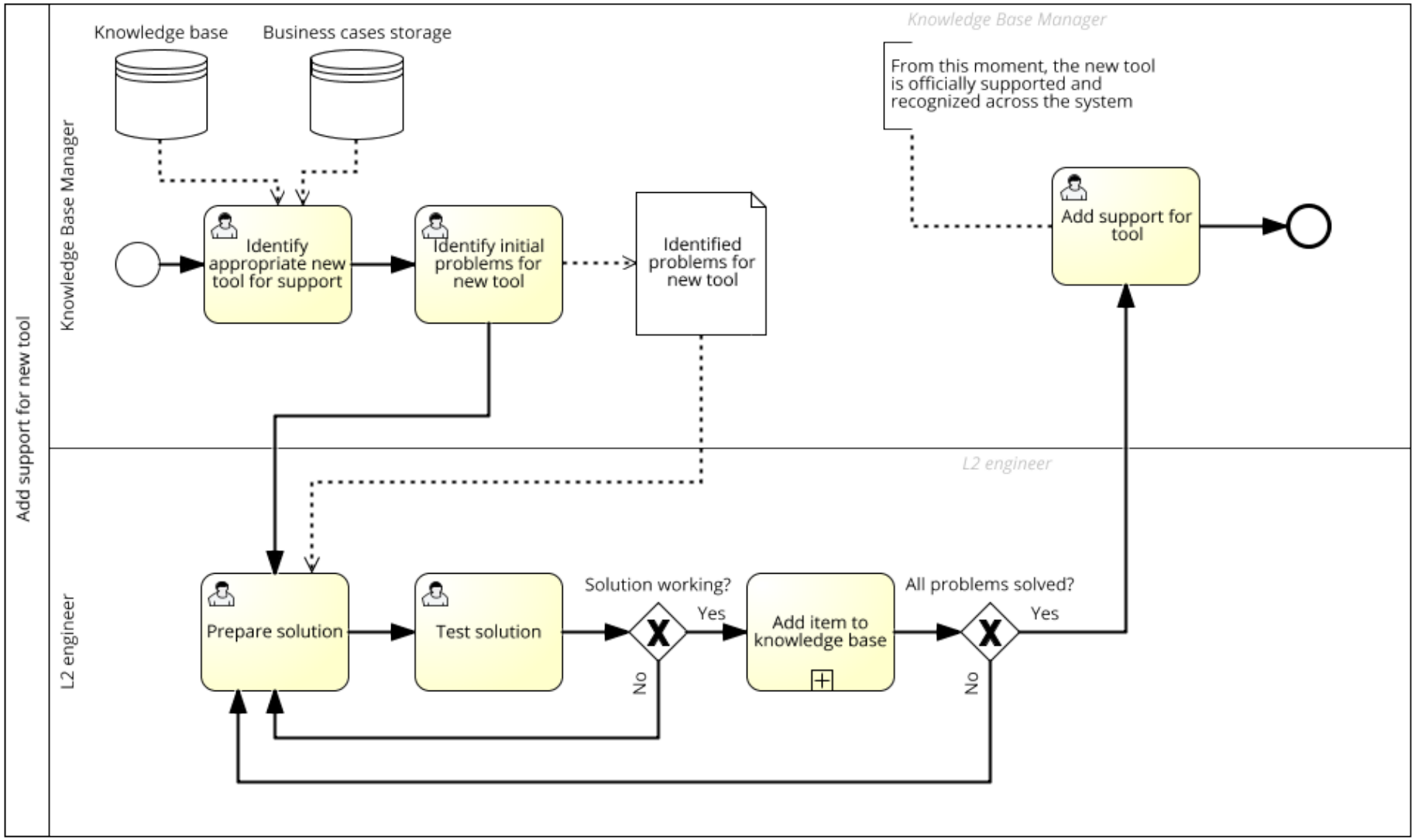
Roles

- Knowledge base manager
  - Identify appropriate new tool to support
  - Identify initial problems for new tool
  - supported tool make official and public

- L2 support engineer
  - Prepare and test solutions

Data objects

- Business cases storage
  - storage where are stored all business cases
- Knowledge base storage
  - storage where are stored all solutions
- Identified problems for new tool
  - Initial problems of new tool that we have to cover by our knowledge base


Add support for new tool
Knowledge Base Manager
Knowledge base
Business cases storage
Identify appropriate new tool for support
Identify initial problems for new tool
Identified problems for new tool
Knowledge Base Manager
From this moment, the new tool is officially supported and recognized across the system
Add support for tool
L2 engineer
L2 engineer
Prepare solution
Test solution
Solution working?
Yes
No
Add item to knowledge base
All problems solved?
Yes
No

Solve Business Case - G: solve every business case reported by customer, G: Provide the most comprehensive first-class knowledge base in targeted domain. [Jan Faron]

Description

This process solve business case and provide response with solution to customer. Our system assign business case to free L1 operator. L1 Operator tries to find appropriate solution in knowledge base. If he find one he tests solution and if solution solve the business case he prepares response with solution to customer. If L1 operator can´t find any other solution he write notes with tried solutions and his oppinions. Our system then assign business case to available L2 operator. L2 operator read notes and solve business case using knowledge base and his skills. Then he prepares response with solution to customer.

Indicators

- KRI: N% of business (for each group: critical, normal) cases solved in 78 hours.
- KRI: N% of business cases solved directly with knowledge base during current month.

Roles

- L1 support engineer
  - Try to solve business case using only knowledge base
  - Test solutions found in knowledge base
  - Write response for customer with solution

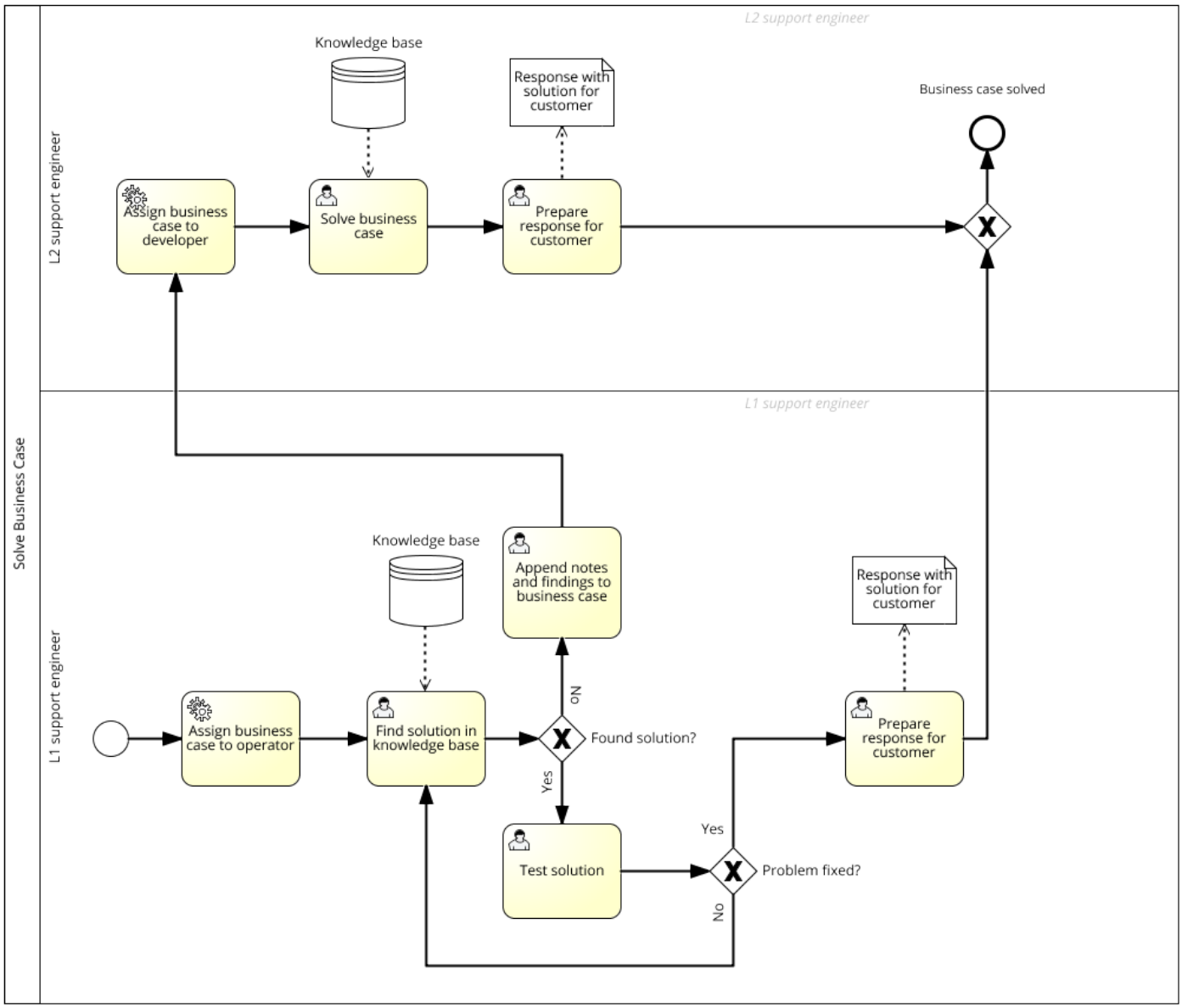
- L2 support engineer
  - Solve business case using knowledge base, notes from L1 support engineer and his skills.
  - Write response for customer with solution

- System
  - Assign business case to available operator

Data objects

- Knowledge base storage
  - storage where are stored all solutions

- Response with solution for customer
  - solution to business case for customer


Solve Business Case
L2 support engineer
L2 support engineer
Knowledge base
Response with solution for customer
Business case solved
Assign business case to developer
Solve business case
Prepare response for customer
L1 support engineer
L1 support engineer
Knowledge base
Append notes and findings to business case
Response with solution for customer
Assign business case to operator
Find solution in knowledge base
No
Found solution?
Yes
Prepare response for customer
Yes
Test solution
Problem fixed?
No

Add item to the Knowledge base - G: Provide the most comprehensive first-class knowledge base in targeted domain [Martin Pitoňák]

Description

This process covers part of work of L2 support engineers, who also maintain the content of the Knowledge base, when they are not actively working cases. When the engineer starts the process, system selects the case which doesn't have the correct solution in the Knowledge base. Engineer then tries to reproduce the issue and writes solution for the issue. At the end it is reviewed/corrected and added to the KB.

Indicators

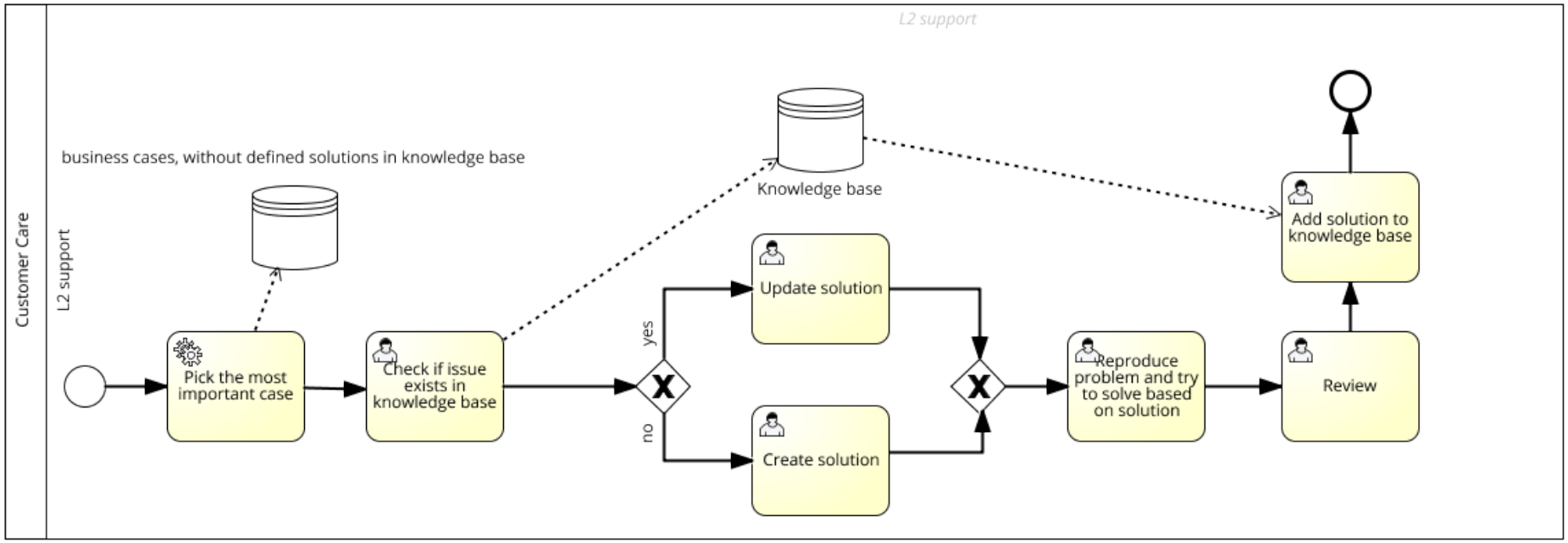
- RI: N% of solutions of business cases added to knowledge base weekly.
- KPI/KRI: Number of added solutions weekly.

Roles

- L2 support engineer
  - Engineer reproduces the issue and writes the solution

Data objects

- Business cases storage
  - storage where are stored all business cases
- Knowledge base storage
  - storage where are stored all solutions


Customer Care
L2 support
L2 support
business cases, without defined solutions in knowledge base
Knowledge base
Pick the most important case
Check if issue exists in knowledge base
yes
no
Update solution
Create solution
Reproduce problem and try to solve based on solution
Review
Add solution to knowledge base

Create/Update subscription - G: Satisfied customers [Martin Pitoňák]

Description

The process describes activities during the creation/update of customer's subscription. Customer sends a request to update the subscription. The request and his account is verified by the system. Then approval is required from responsible person. Process ends if payment for subscription is received, or it is not received for a week.

Indicators

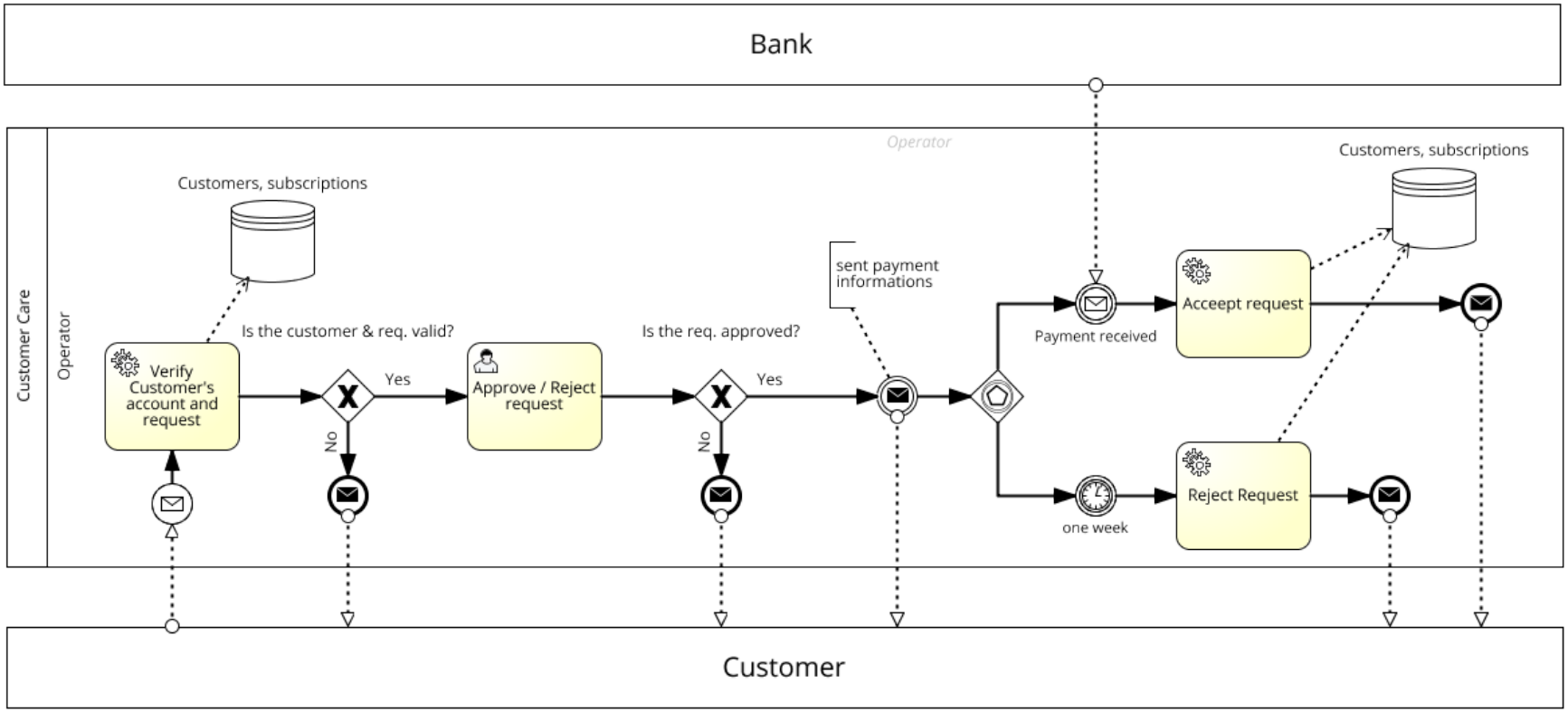
- KRI: N% of customers with renewed subscription each month.
- KPI: N of paying customers.

Roles

- Operator
  - updates status of the subscription

Data objects

- Customer storage
  - storage where are stored all customers
- Subscription storage
  - storage where are stored all subscriptions


Bank
Customer Care
Operator
Operator
Customers, subscriptions
Verify Customer's account and request
Is the customer & req. valid?
Yes
No
Approve / Reject request
Is the req. approved?
Yes
No
sent payment informations
Payment received
one week
Acceept request
Reject Request
Customers, subscriptions
Customer

Implementation

Used platform and software

Majority of the team members are experienced Java developers, therefore, the decision was made to use JBoss BPM Suite concretelly its comunity project jBPM. The version used is 6.4.0 which was by the time of writing this paper the latest.

Fake SMTP server was used for testing email functionality. REST API's which are called from processes are implemented in JAX-RS. The imlementation framework of JAX-RS is Dropwizard which is very popular for building microservices. It produces fat Jar file which is very easy to invoke and there is no need for additional application server.

Library OkHttpClient is used for client invocatio of our microservices.

For the most of the implemented activites we implemented special handlers which implement WorkItemHandler interface.

Complete technology stack:

- jBPM 6.4.0 (requires Apache ant)
- Java 8
- Apache Maven 3
- Dropwizard
- OkHttpClient
- Fake SMTP Server
- Git

Implemented services

1. ***Email validation: services/email***

This service simulates email validation. It receives an email which is validated. The service could also check if the email is from banned domain.

2. ***Bank service***

Bank service for simulation communicatin with bank entity. In th final version of processes we decided to not use this endpoint and simulate payments with a signal.

Implemented processes

1. ***Customer Registration***

Process customer registration was chosen for implementation because we think that it is very related to our goal which denotes growth of the company. By the invocation of this process we can easy determine how many new customers we have and in other words how fast is the company growing.

2. ***Create ticket***

Create ticket process is called when user/customer sends ticket to the system. Ticket (in our system represented as business case) consists of title, description and priority which can be later on altered by our employees. This process consists of two subprocesses: Create Business Case and Solve Business Case. Translation of the ticket body also takes place in this process.

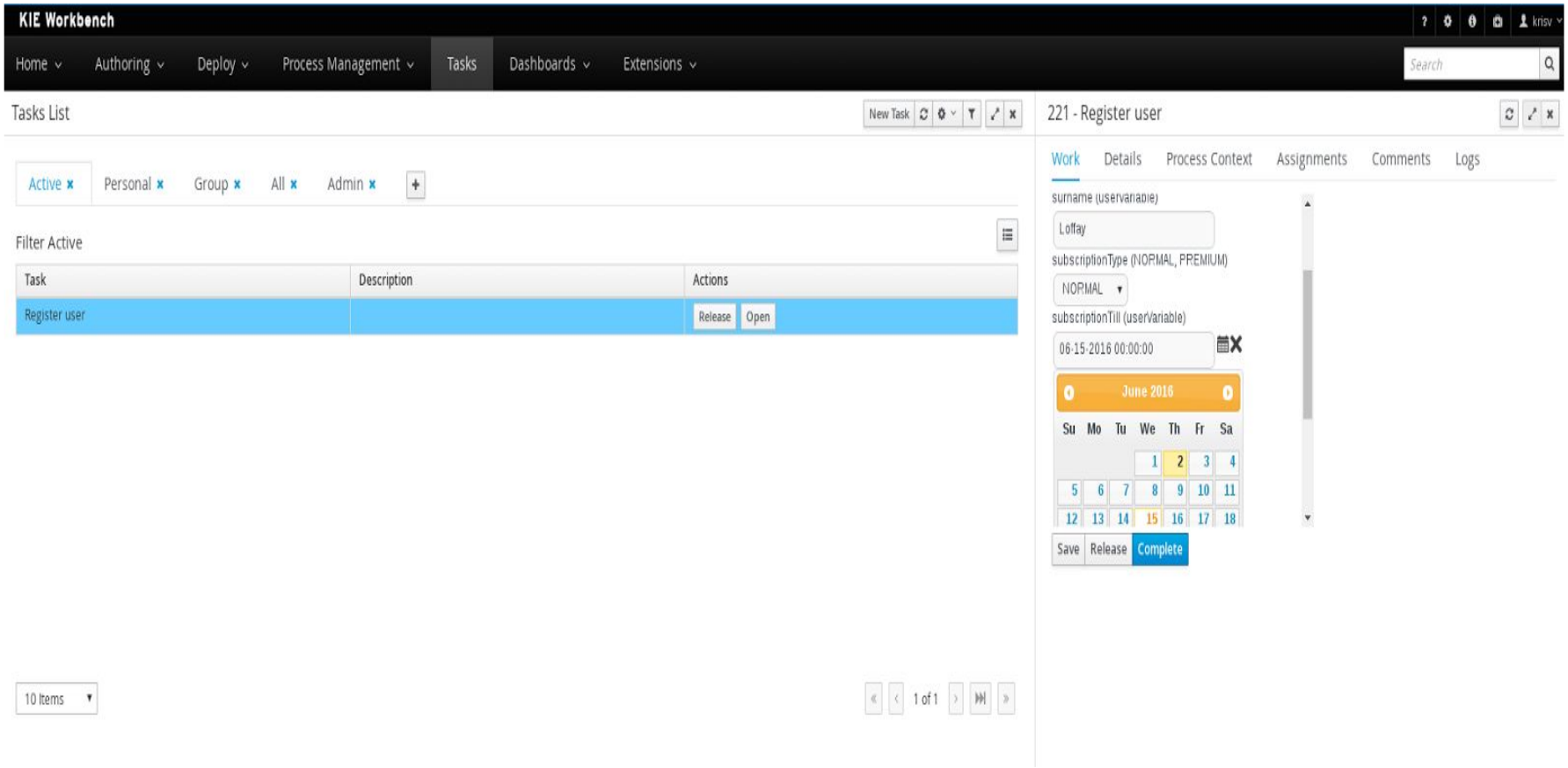
3. *Validate business case and subscription*

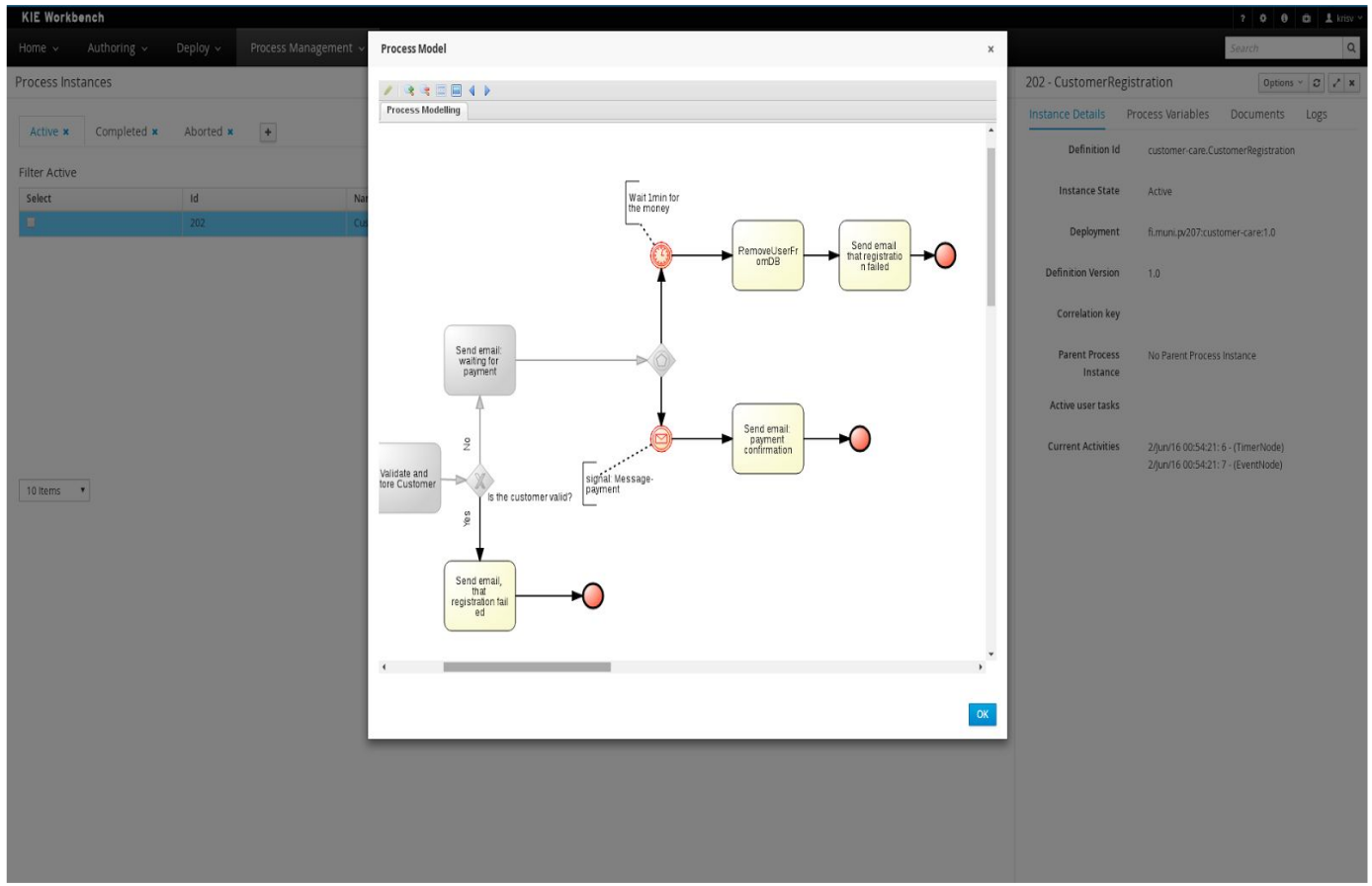
The crucial point in our application is the moment of verification that the customer has the valid subscription, hence can be served by our support specialists. For verification we have implemented service, that checks the customer's subscription. Subscription represents date (till valid) and type (premium/default). If the date is in future, the subscription is valid, otherwise is invalid and the customer is informed via our custom mail service. If the subscription is valid and the type of the subscription is "premium" the customer recieves mail that we are working on his/her business case. Our employees can alter the priority of the business case. Employee work with read-only form of business case, only modifiable field is priority of business case. The customer fills the priority level based on his preferences and best knowledge, we adjust the level of priority to fit the needs of our all customers. Priority can be altered based on our knowledge about the problem, customer situation and subscription type. The last step is to add the business case into the queue (business case storage). Before that, the process is checked by our custom implemented services. The purpose of the service is to check if the business case has filled ID field, if it does, then the process is merged with the business case of provided ID. ID field is filled by customer during the ticket creation.

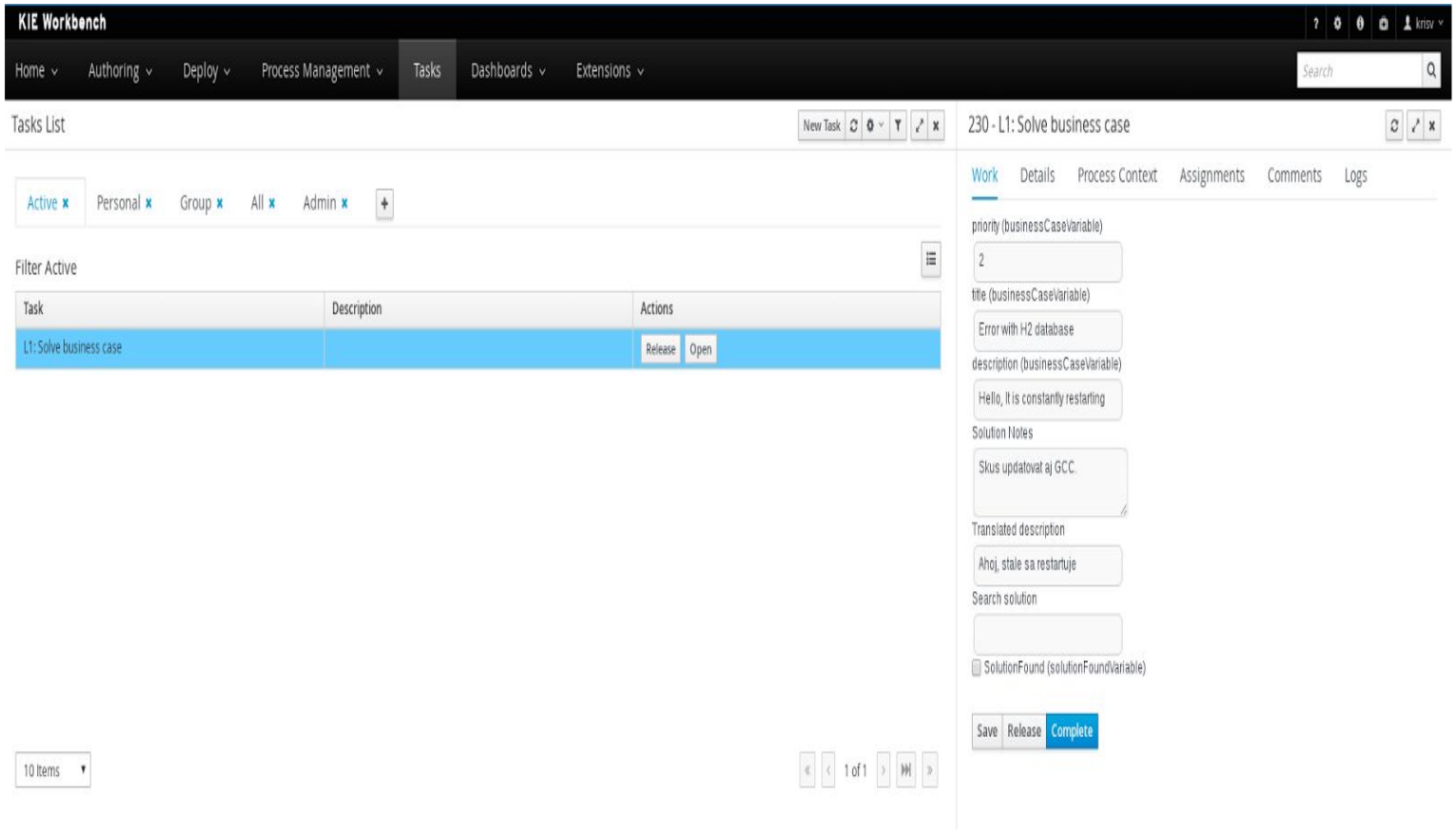
4. *Solve business case*

First level of support (operators) solves the most of business cases. Our custom service task assigns business cases to free operators. It is just mocked implementation of verbose service. Service expects that there is only one operator and it's always ready for new business case. Operator tries to find the solution in knowledge base for given business case. To simulate the process of finding the solution, we have implemented the form where user can check the checkbox if the solution was found or not. If it is found the solution must be tested. Again the same principle (checkbox form) is used for this task. If it is successfuly fixed the problem, the operator prepares response with solution to customer and the process is concluded. Once the business case is unsolvable for the operator, he/she fill the notes (via business case form) of tried solutions to business case. The provided notes are later used by level 2 support. Level 2 support operator always solve business case and then he prepares response with solution to customer.

Screenshots


KIE Workbench
krisv
Home
Authoring
Deploy
Process Management
Tasks
Dashboards
Extensions
Search
Tasks List
New Task
Active
Personal
Group
All
Admin
Filter Active
Task
Description
Actions
Register user
Release
Open
10 Items
1 of 1
221 - Register user
Work
Details
Process Context
Assignments
Comments
Logs
surname (userVariable)
Loffay
subscriptionType (NORMAL, PREMIUM)
NORMAL
subscriptionTill (userVariable)
06-15-2016 00:00:00
June 2016
Su Mo Tu We Th Fr Sa
1 2 3 4
5 6 7 8 9 10 11
12 13 14 15 16 17 18
Save
Release
Complete


KIE Workbench
Home
Authoring
Deploy
Process Management
Process Instances
Active
Completed
Aborted
Filter Active
Select
Id
202
10 Items
Process Model
Process Modelling
Wait 1min for the money
RemoveUserFr omDB
Send email that registratio n failed
Send email: waiting for payment
Send email: payment confirmation
Validate and tore Customer
No
Is the customer valid?
signal: Message-payment
Yes
Send email, that registration fail ed
OK
202 - CustomerRegistration
Options
Instance Details
Process Variables
Documents
Logs
Definition Id
customer-care.CustomerRegistration
Instance State
Active
Deployment
fi.muni.pv207:customer-care:1.0
Definition Version
1.0
Correlation key
Parent Process Instance
No Parent Process Instance
Active user tasks
Current Activities
2/jun/16 00:54:21: 6 - (TimerNode)
2/jun/16 00:54:21: 7 - (EventNode)


KIE Workbench
krisv
Home
Authoring
Deploy
Process Management
Tasks
Dashboards
Extensions
Search
Tasks List
New Task
Active
Personal
Group
All
Admin
Filter Active
Task
Description
Actions
L1: Solve business case
Release
Open
10 Items
1 of 1
230 - L1: Solve business case
Work
Details
Process Context
Assignments
Comments
Logs
priority (businessCaseVariable)
2
title (businessCaseVariable)
Error with H2 database
description (businessCaseVariable)
Hello, It is constantly restarting
Solution Notes
Skus updatovat aj GCC.
Translated description
Ahoj, stale sa restartuje
Search solution
SolutionFound (solutionFoundVariable)
Save
Release
Complete

Teamwork and tasks

Pavol Loffay [Team leader, Business analyst, Process analyst, Developer]

- Organizational stuff
- Proposed this domain for the project (homework)
- Vision, Mission, Goals/objectives
- Processes Create business case, Solve business case, Validate business case. Create user.
- git, dropwizard...
- Implemented most of the project
- Wrote most of the general stuff of this documentation

Milan Pánik [Business analyst, Process analyst, Developer]

- analyze the domain
- create BPDs of Account the employees, Generate reports, Validate business case and subscription
- implement process Validate business case and subscription
- write documentation for given tasks

Jan Faron [Business analyst, Process analyst, Developer]

- Domain analysis
- Process design: Add support for new tool, Solve business case
- implement process Solve business case, fix implementation issues and help implement other processes
- write documentation for given tasks

Martin Pitoňák [Business analyst, Process analyst, Developer]

- Domain analysis
- Process design: Create/Update subscription, Add item to knowledge base
- Fixing implementation issues