DEMONSTRATION RUN REPORT

D5.6

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EXECUTIVE SUMMARY

This deliverable, D5.6 - DEMONSTRATION RUN REPORT provides a broker (end-user) and customer (end-end-user) oriented viewpoint of the demonstration at the broker site.

Broker and customer oriented demonstrations of Business Processes as a Service (BPaaS) have already been given after project-years 1 and 2. The demonstration addressed here is reflecting how a concrete evolution of the initially introduced start-up “Golden Worm” towards an “enterprise” scale, can be supported with CloudSocket.

In a consultation process between broker and customer, the targeted Golden Worm complete BPaaS lifecycle has been realized by walk-through through the four phases with their corresponding environments of CloudSocket – design, allocation, offer/execution, evaluation. During this consultation process the decisions concerning the BPaaS services and components, the support from the innovation item “ontology-based context adaptive questionnaire” and the business process cost simulation tool from the design environment has been found useful.

In general, from a broker’s site the demonstration was a continuous interaction with the tool development (WP4) and the research (WP3), hence this demonstration is based on the 2nd CloudSocket prototype that already includes some innovation injections and provides a complete set of tools, which are provided and described in D4.6,7,8.

The design phase is a knowledge-intensive interaction with the customer, where both – the consultant and customer – require a minimum understanding of business processes and IT system interactions. Supporting tools for maturity assessment, selection of appropriate cloud offerings or cost simulations to make the correct choice are provided in a variety of complexity, hence training on handling the tool and the algorithms is required by the consultant.
The design and configuration of executable workflows requires in-depth knowledge about software engineering, workflows and cloud computing. In this phase the broker himself likely requires support from specialized consultants.

The allocation phase is considered as transparent to the customer, where the broker – assuming to have a reasonable set of reference content – configures the BPaaS offerings.

The execution phase had been considered from both sides – the broker and the customer – as intuitive to use with respect to the marketplace that offers to browse, compare, select and buy a concrete BPaaS bundle. The handling of workflows requires training and support for using the former from the customer viewpoint, whereas the operation of BPaaS requires training and support for appropriate technical monitoring from the broker viewpoint.

The establishment of an appropriate evaluation environment is a challenge, which starts by expressing the intension of the broker in form of goal definitions in a cause-and-effect model, the specification of key performance indicators (KPIs) and their evolution over the time as well as the technical setup of appropriate sensor and data queries that deliver the requested information.

After the transit through the aforementioned BPaaS phases and the usage of the corresponding tools, a feedback is provided. Key notions of the ISO/IEC 25000 series, SQuaRE (Software product Quality Requirements and Evaluation) have partly served as a guideline, although there was no intention to perform a “standardised” quality evaluation.

While specifically related to the BWCON use case “The Golden Worm” the results reported in this deliverable should be applicable to other project use cases and to the CloudSocket BPaaS realization in general.

PROJECT CONTEXT

Workpackage	WP5: CloudSocket Demonstration
Task	T5.6: Demonstration Run and Evaluation
Dependencies	Based on D4.6-D4.7-D4.8, and WP5

Contributors and Reviewers

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Version History

Version	Date	Authors	Sections Affected
0.1	October 26, 2017	Yongzheng Liang (BWCON)	Initial ToC
0.8	December 11, 2017	Yongzheng Liang (BWCON) and ALL	ToC update, initial complete "text-logic" of the deliverable
0.82	December 14, 2017	Yongzheng Liang (BWCON)	Cleaning of figures; Chapter 5 Feedback to Implementation and Research preliminary version
0.9	December 20, 2017	Yongzheng Liang (BWCON) and ALL	Updated all
0.96	December 22, 2017	Yongzheng Liang (BWCON) reviewer input	Updated all, ready for internal review
1.0	December 29, 2017	Yongzheng Liang (BWCON)	Updated based on review comments, Finial version

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TABLE OF CONTENT

LIST OF FIGURES

LIST OF TABLES

1 INTRODUCTION AND PROBLEM STATEMENT

1.1 Project Context

This deliverable, D5.6 DEMONSTRATION RUN REPORT concerns the final demonstration of Work package 5 CloudSocket Demonstration and the related task of the latter - T5.6 Demonstration and Evaluation Run.

Broker and customer oriented demonstrations of CloudSocket's "Business Processes as a Service", BPaaS, have been already given after project-years 1 and 2. The demonstration described here is reflecting the evolution of the related "Golden Worm" initial start-up company towards "enterprise" scale.

In a consultation process between broker and customer, the targeted Golden Worm complete BPaaS lifecycle has been realized by walk-through through the four phases with their corresponding environments of CloudSocket – design, allocation, offer, execution, evaluation.

With respect to the degree of implementation and integration reached, in Work Package 4, and the inclusion of research results, from Work Package 3, this deliverable D5.6 is essentially based on deliverable D4.6-D4.7-D4.8.

The deliverable also provides feedback to the implementation and research track of the project.

While specifically related to the BWCON use case "The Golden Worm" the results reported in this deliverable should be applicable to other project use cases and to the CloudSocket BPaaS realization in general.

1.2 Problem Statement

This document reports on how successful the "hand-over" of the whole and complex CloudSocket approach to the broker can be performed in realistic situations, when only a minimum of support and consultancy is provided and the broker interacts with the customer bilaterally.

This exercise had the aim to identify missing documentation and necessary training. It underlines the need for support from consultants to assist the broker.

In more detail this task examined:

- Explore the integration of the approach of the four phases: design, allocate, offer / execute and evaluate
- Explore the degree of technical integration between the four environments - design, allocation, marketplace/execution and evaluation.
- Explore the whole lifecycle of both – the CloudSocket approach and the provided CloudSocket platform - from a broker's and customer point of view
- In particular explore decision support for the broker concerning applicability, power and usefulness of the
    - Process Simulation feature of the Design Environment
    - Semantic framework under the shape of the more user-friendly Context-Adaptive Questionnaire
- Explore the realized capabilities and potential usage of the different Cloud service models IaaS, SaaS and/or PaaS
- The experiences addressing aforementioned bullet-points are reported in this document, a critical analysis providing evaluation and feedback is provided as a separate document in form of D6.1.

2 DEMONSTRATION SCENARIOS

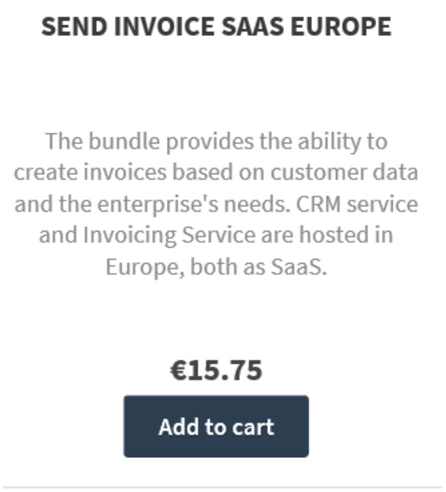
In CloudSocket the "tangible goods" are BPaaS published as so-called bundles in the CloudSocket Marketplace. BPaaS bundles can be provided in different states of completion: (a) BPaaS bundles labelled with "Add to cart" can be bought and executed; (b) BPaaS bundles labelled "I want it" (see Figure 24), cannot be bought but an interaction with the broker is established to help the decision making, to finalise the BPaaS bundle by the broker of not.

This second option to also provide semi-finished BPaaS bundles has been found as extremely useful for the broker who needs to assess carefully in which BPaaS bundle to invest. The more interested users are interacting with the broker, the higher the likelihood that a BPaaS bundle addressing the expressed expectations from the customers will be bought.

2.1 Story board in the second-year review

Susan, a biologist, runs the start-up "The Golden Worm" to convert biological waste into high quality humus. For running the business, she needs an affordable business administration software, which in particular allows creating and sending invoices to the customers.

A BWCON consultant, in the role of the "broker", may suggest having a look at the CloudSocket Marketplace.



SEND INVOICE SAAS EUROPE

The bundle provides the ability to create invoices based on customer data and the enterprise's needs. CRM service and Invoicing Service are hosted in Europe, both as SaaS.

€15.75

Figure 1: The CloudSocket BPaaS "bundle" "Send Invoice SaaS Europe"

Susan opens the CloudSocket Marketplace at http://csmarket.ymens.com/#/product-list. There are three offerings for the "Send Invoice" use case: Two SaaS solutions with hosting in the US or Europe and one restricted to Europe. The related CRM and Invoicing Service are both provided as SaaS. The IaaS solution provides hosting in Europe with a CRM as SaaS and the Invoicing Service via an IaaS.

For compliance ("Europe") and technical (no dealing with infrastructure issues) reasons Susan decides for the solution "Send Invoice SaaS Europe".

After registration, registration confirmation and log in to the Marketplace, Susan selects the "Add to cart" button - and after providing the requested payment information the product is bought!

2.2 Final demonstration scenario

The final demonstration scenario is based on the second-year review demonstration - again on the start-up "The Golden Worm". The start-up has grown now towards "Enterprise" scale and CloudSocket is aiming to support the enterprise (see Figure 2). Videos of this demonstration can be seen on the CloudSocket channel on YouTube:

(a) https://www.youtube.com/watch?v=kHzwH5RMR20
(b) https://www.youtube.com/watch?v=9i17BPAw-B8
(c) https://www.youtube.com/watch?v=Chqd7tVxb90

The Golden Worm is facing new challenges. One is concerning Invoice Management: the expanded company will have different locations to produce humus. Customers will be in different countries, possibly even in different continents. In the current Invoicing process, an accountant saves all invoices in the local file system(s). Susan, the enduring "CEO", now wants to have a centralized Invoice System with high availability for all distributed locations. The other challenge is that after company expansion, there are also more accountants working on the Invoice System concurrently and therefore the systems need to be more efficient.

Indefatigable Susan of The Golden Worm doesn't hesitate to contact the paradigmatic BWCON consultant-broker.

During the Golden Worm – BWCON - consulting session, the partners eventually agree to update the current Send Invoice Business Process:

1. To add a separate, centralized storage to save all invoices together in a central location – the Document Management requirement
2. To allow for more transactions by more concurrent users, - the Resource Provision and Performance Management requirement

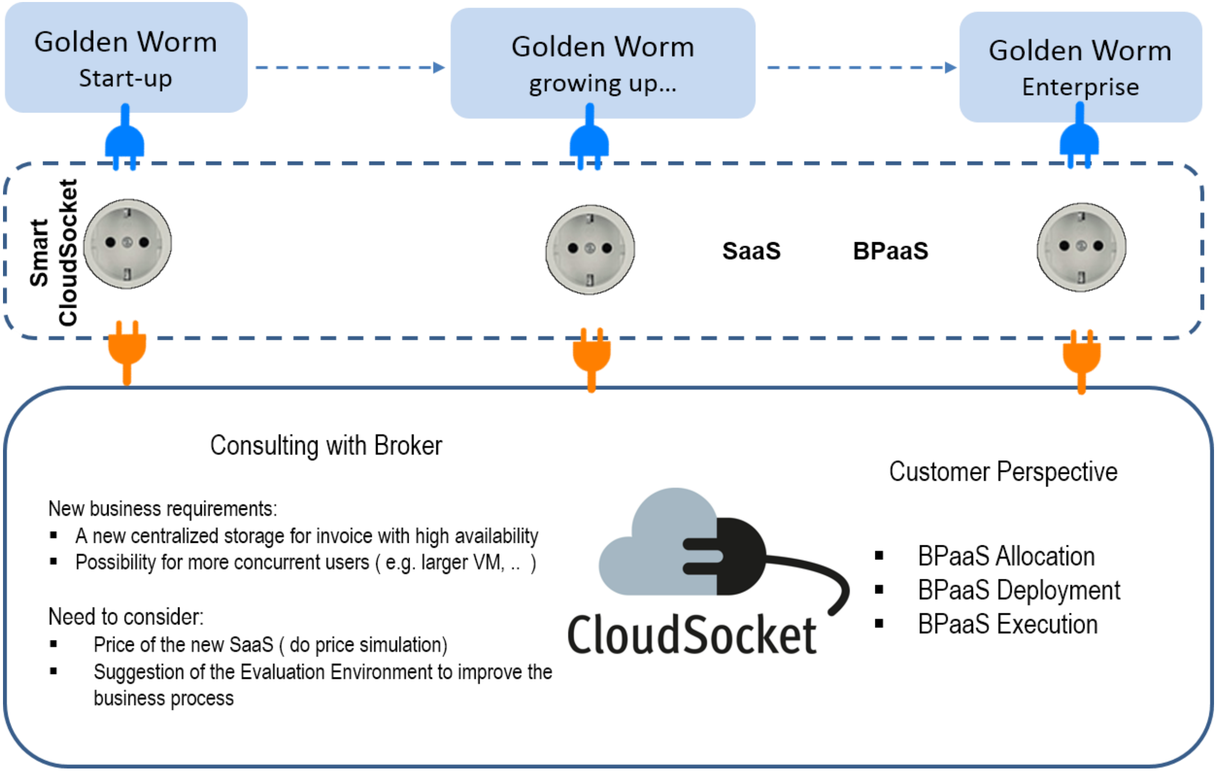

Golden Worm
Start-up
Golden Worm
growing up…
Golden Worm
Enterprise
Smart CloudSocket
SaaS
BPaaS
Consulting with Broker
New business requirements:
A new centralized storage for invoice with high availability
Possibility for more concurrent users (e.g. larger VM, ..)
Need to consider:
Price of the new SaaS (do price simulation)
Suggestion of the Evaluation Environment to improve the business process
CloudSocket
Customer Perspective
BPaaS Allocation
BPaaS Deployment
BPaaS Execution

Figure 2: CloudSocket supports growing company towards Enterprise

3 CONSULTING SERVICE

Following the initial "discussions" between Susan and the BWCON-broker this chapter is going to elaborate on the different consulting and design steps leading to a BPaaS bundle publishable in the Marketplace. We are taking-off from the general CloudSocket consultation process, depicted in the following

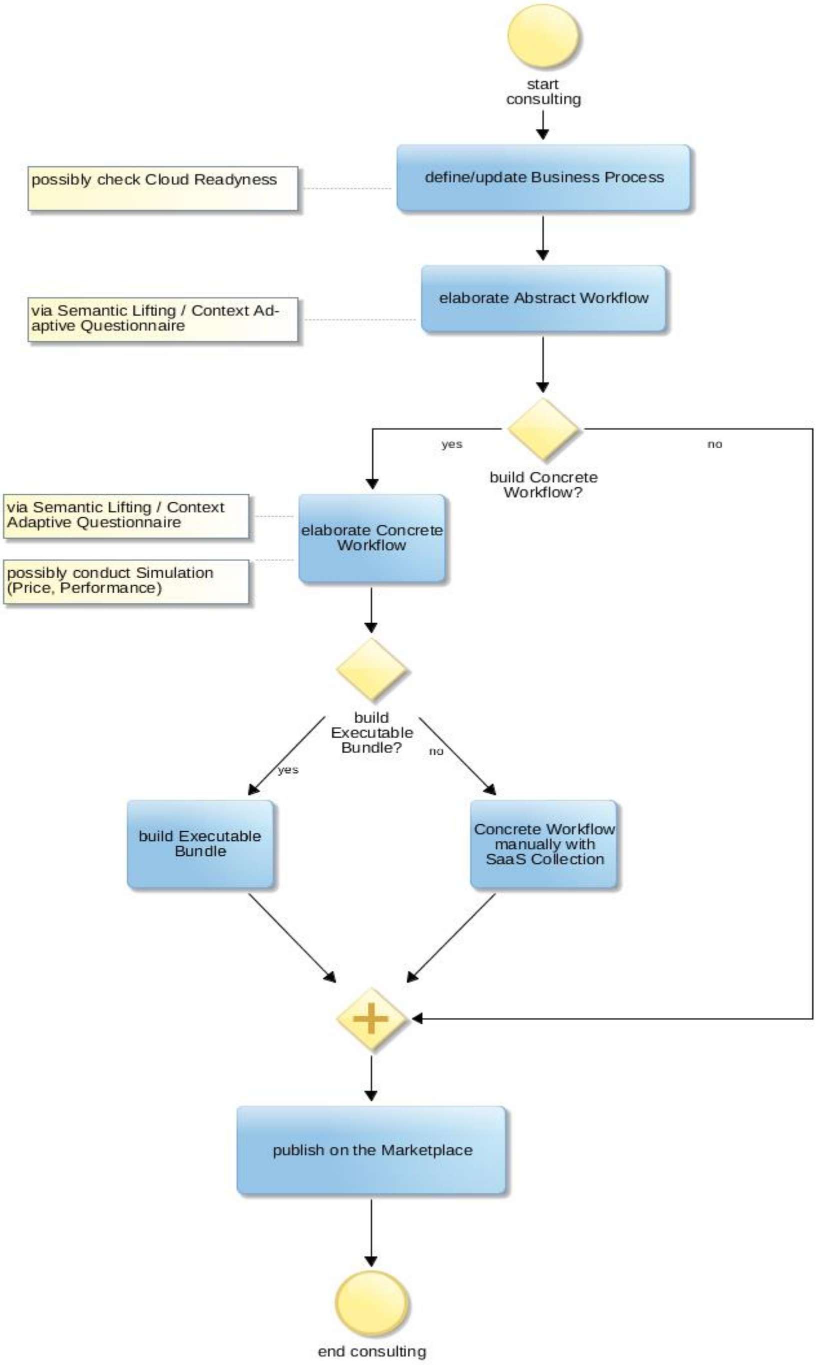

start consulting
possibly check Cloud Readyness
define/update Business Process
via Semantic Lifting / Context Ad-aptive Questionnaire
elaborate Abstract Workflow
yes
no
build Concrete Workflow?
via Semantic Lifting / Context Adaptive Questionnaire
possibly conduct Simulation (Price, Performance)
elaborate Concrete Workflow
build Executable Bundle?
yes
no
build Executable Bundle
Concrete Workflow manually with SaaS Collection
publish on the Marketplace
end consulting

Figure 3: The Consulting Process

Figure 3

3.1 BPaaS Design

The final goal of the BPaaS design process is the creation of the necessary elements that can be taken over and elaborated on by the Allocation Environment, and are becoming part of a BPaaS bundle that can be published on the Marketplace.

The BPaaS design may start from scratch – creating via the BPaaS Designer a so-called Design Package; (see Figure 4). This design package is a so-called "transit model", hence it combines relevant models to an agreed package and exports it into an agreed file format. So, this Design Package model does not provide additional information but groups either all or at the necessary elements to be considered for further processing:

- BP: Business Process – reference to the business process shown in the marketplace
- WF: Workflow – reference to the workflow executed by the workflow engine
- KPI: Key Performance Indicator – configuration information for the monitoring environment
- DM: Decision Model and Notation – adaptation rules for adaptive deployment and CAMEL support

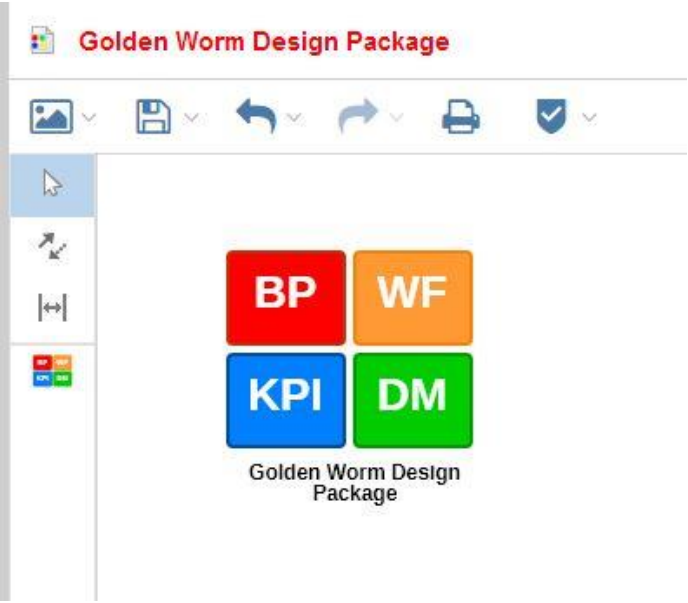


Figure 4: Design Package initial user interface

Alternatively, the "necessary elements" can be also created separately – for example from pre-existing ones – and later manually combined as an input to the Allocation Environment.

3.1.1 Business Process Design

For the Golden Worm after its initial growing process it is proposed not to create a new business process from scratch but just to extend the successful initial one – again shown in the Figure 5 **Fehler! Verweisquelle konnte nicht gefunden werden.**. This pre-existing business process can be found by clicking the red BP box in Figure 4

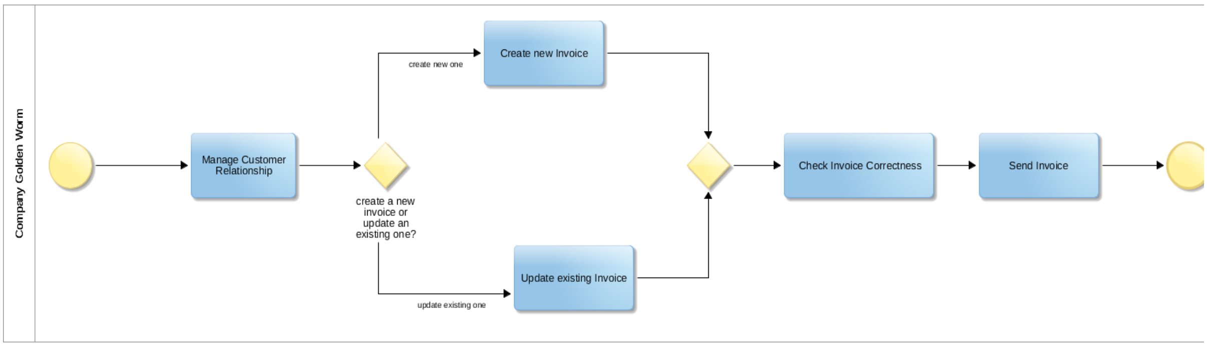


Figure 5 Original business process Send Invoice

Recollecting the new requirements of the Enterprise Golden Worm – a centralized high-availability document repository and increased performance to cope with the increased numbers of accountants – the old business process according to the figure above will be extended as shown in the following.

3.1.2 Mapping Business Process to Abstract Workflow

An Abstract Workflow (expressed in BPMN) is an elaboration of the business process (also expressed in BPMN) into a technology-oriented representation: Potential (individual) Cloud services are positioned in Tasks in separate Lanes. In this sense, Figure 6 is repeating the division of the Golden Worm start-up business process into two Cloud services positioned into the two Lanes "CRM" and "Invoicing System".

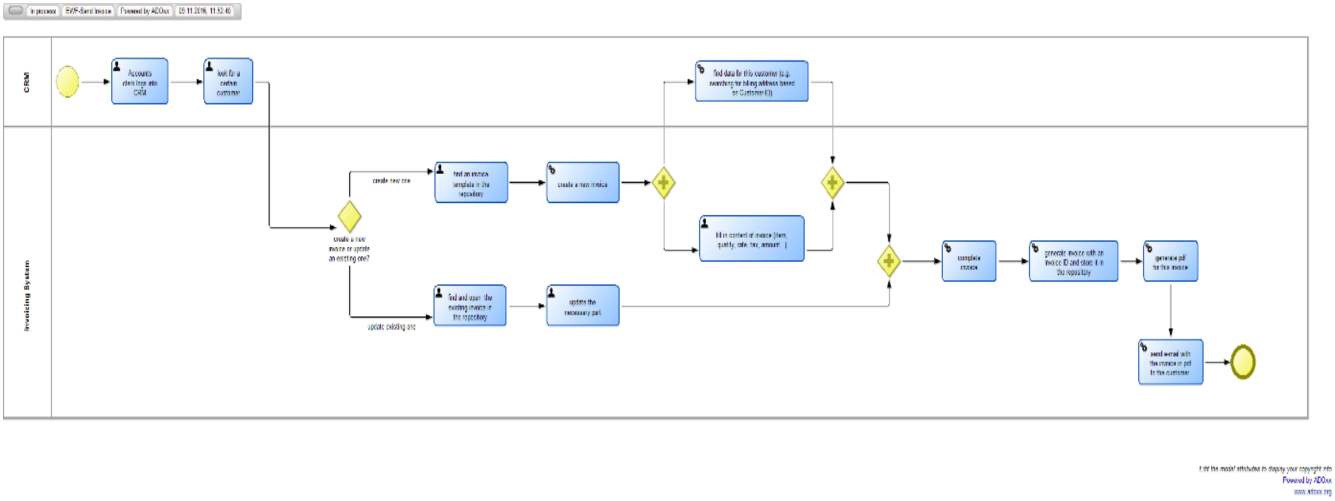

In process
EWF-Send Invoice
Powered by ADOxx
09.11.2016, 11:52:40
CRM
Invoicing System
Accounts clerk logs into CRM
look for a certain customer
create a new invoice or update an existing one?
create new one
find an invoice template in the repository
create a new invoice
update existing one
find and open the existing invoice in the repository
update the necessary part
find data for this customer (e.g. searching for billing address based on Customer-ID)
fill in content of invoice (item, quantity, rate, tax, amount ...)
complete invoice
generate invoice with an invoice ID and store it in the repository
generate pdf for the invoice
send e-mail with the invoice in pdf to the customer
Edit the model attributes to display your copyright info
Powered by ADOxx
www.adoxx.org

Figure 6 Abstract Workflow for Golden Worm start-up

To reflect the requirement "centralized document repository" in the next step the Task "Send Invoice" in drawn into a/the new Lane "Document System"; see Figure 7.

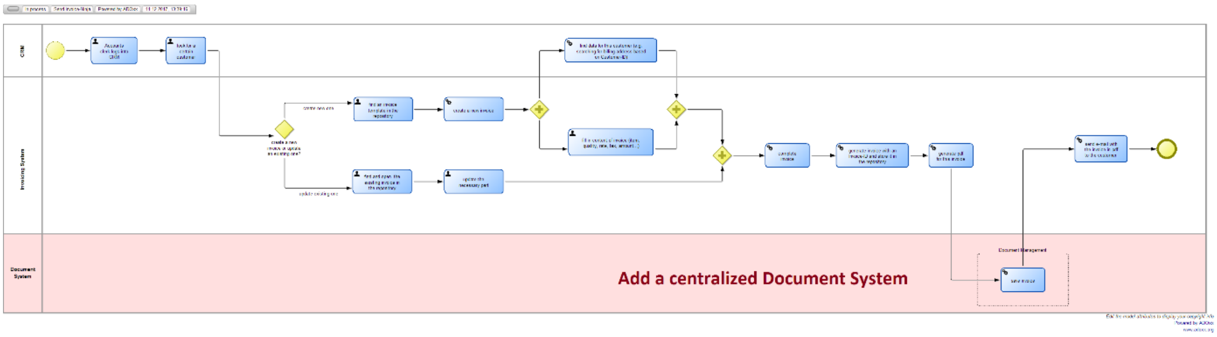
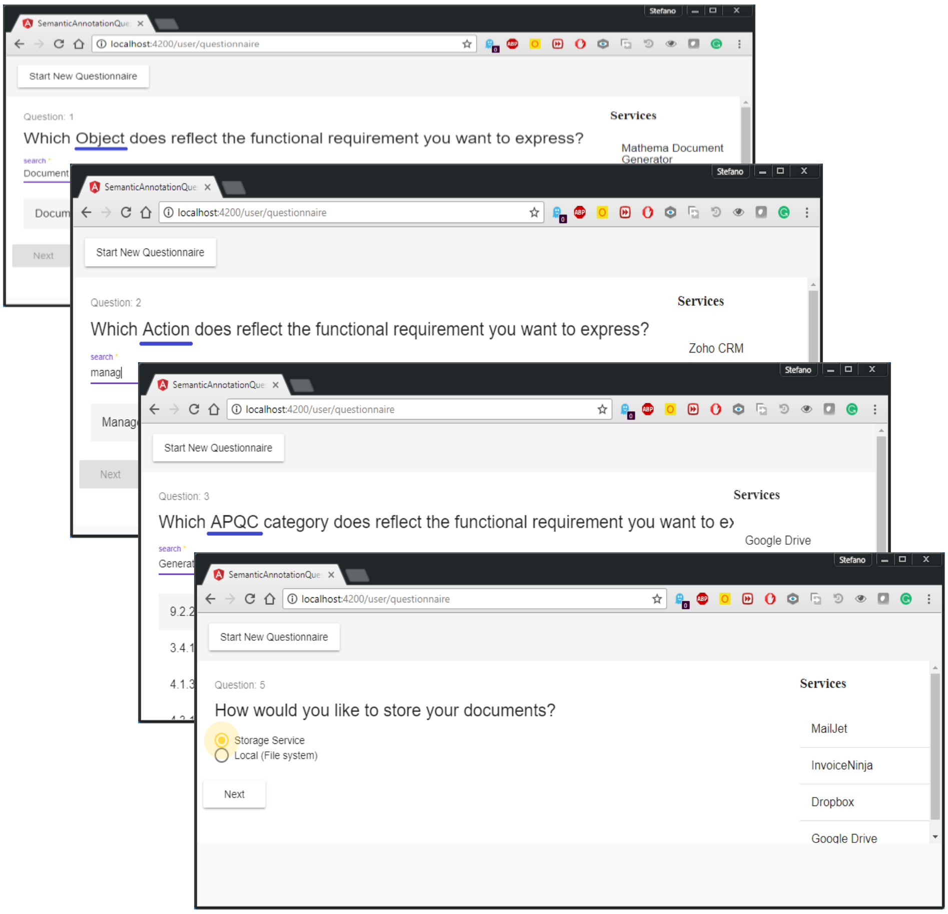


Figure 7 Abstract Workflow for Golden Worm towards Enterprise

3.1.3 Mapping Abstract Workflow to Concrete Workflow

After “mapping” the business process Task “Send Invoice” into an “abstract Cloud service”, i.e. placing it into a separate lane, the next step is to find potential concrete services that could fulfil the related requirements. As part of the BPaaS Design Environment, this function is supported by the CloudSocket Context Adaptive Questionnaire (CAQ)[6]. As the CAQ is operating on BPMN-defined Groups the “Save Invoice” must become a group as shown in Figure 7.

The “service discovery process” via the CAQ – after a right mouse click on the Group “Save Invoice” is carried out in a series of questions using the combined functional APQC-object/action ontology developed in CloudSocket; see the CAQ screenshots Figure 8**Fehler! Verweisquelle konnte nicht gefunden werden.**, and deliverables D3.2 Modelling Prototype for BPaaS [4], and D8.4 Training Design Phase [5].



Question: 1
Which Object does reflect the functional requirement you want to express?
search: Document
Services: Mathema Document Generator

Question: 2
Which Action does reflect the functional requirement you want to express?
search: manag
Services: Zoho CRM

Question: 3
Which APQC category does reflect the functional requirement you want to e›
search: Generat
9.2.2
3.4.1
4.1.3
Services: Google Drive

Question: 5
How would you like to store your documents?
● Storage Service
○ Local (File system)
Services: MailJet, InvoiceNinja, Dropbox, Google Drive

Figure 8: Functional Object-Action-APQC ontology questions of the Context Adaptive Questionnaire

As the preliminary result – taking into account the functional requirements - there are two concrete services proposed for the Task "Save Invoice" – Dropbox and Google Drive. Here we assume a decision for Dropbox. In the future – after successful operations of the CloudSocket framework – such a decision could be possibly supported by decision rules accumulated in the systems knowledge bases (see D6.2 [6]) or detailed process simulations (see next paragraph).

3.1.4 Simulation

After the selection of a realization of the "Save Invoice" task this paragraph is demonstrating the usage of the CloudSocket simulation tool to decide – based on price - between the usage of Dropbox as a SaaS or its integration into the existing Send Invoice as a BPaaS. Before simulating the different BPaaS alternatives, the different costs and the probabilities need to be calculated. This preparation considers assumptions based on expert knowledge.

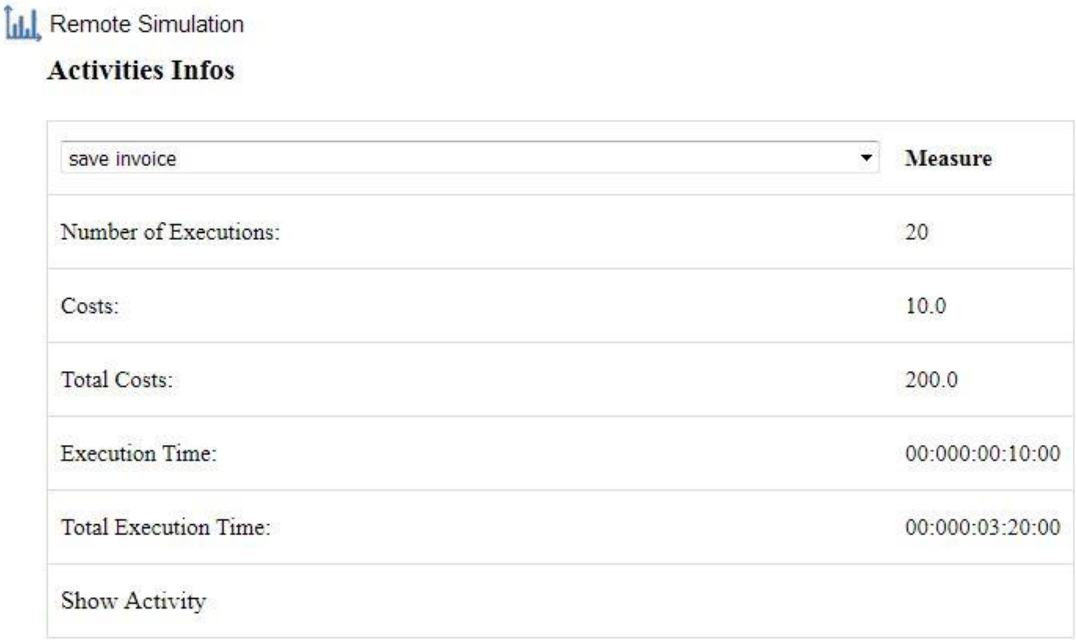
Two cases with 4 sub-cases are simulated for the task "Save Invoice" in the updated business process:

- 20 invoices per month are generated, with sub-cases: manual (SaaS) or automatic (BPaaS) using the document system
- 200 invoices per month are generated, in consideration of both SaaS and BPaaS

Assumptions:

- For saving invoices manually, an accountant needs 10 minutes
- For saving invoices automatically, an accountant needs 1 minutes
- Personal cost for an accountant is 1€ per minute
- SaaS costs 20€/month
- BPaaS costs 300€/month

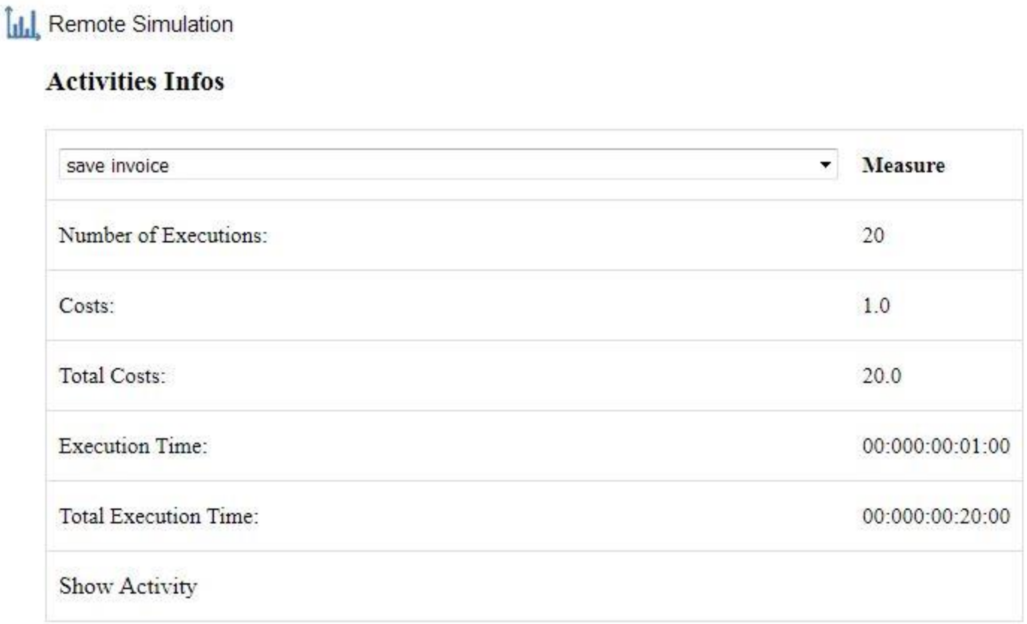
The following four figures present the simulation results in the BPaaS Designer.



Activities Infos

save invoice	Measure
Number of Executions:	20
Costs:	10.0
Total Costs:	200.0
Execution Time:	00:000:00:10:00
Total Execution Time:	00:000:03:20:00
Show Activity	

Figure 9: Simulation results for 20 invoices /month, using SaaS manually

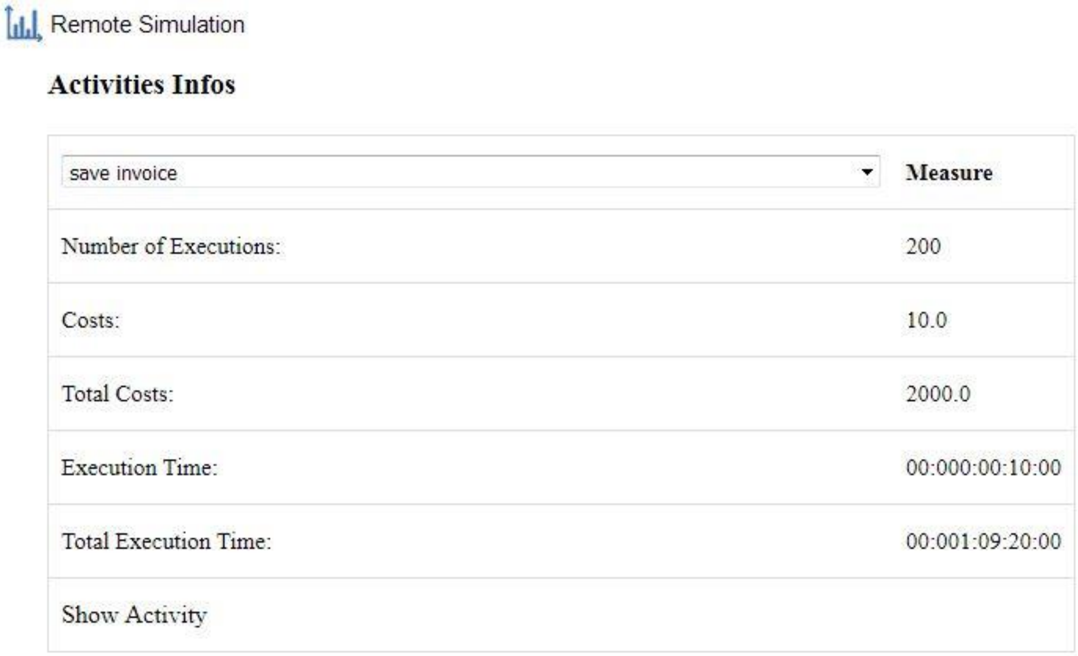


Remote Simulation

Activities Infos

save invoice ▾	Measure
Number of Executions:	20
Costs:	1.0
Total Costs:	20.0
Execution Time:	00:000:00:01:00
Total Execution Time:	00:000:00:20:00
Show Activity	

Figure 10: Simulation results for 20 invoices /month, using BPaaS automatically

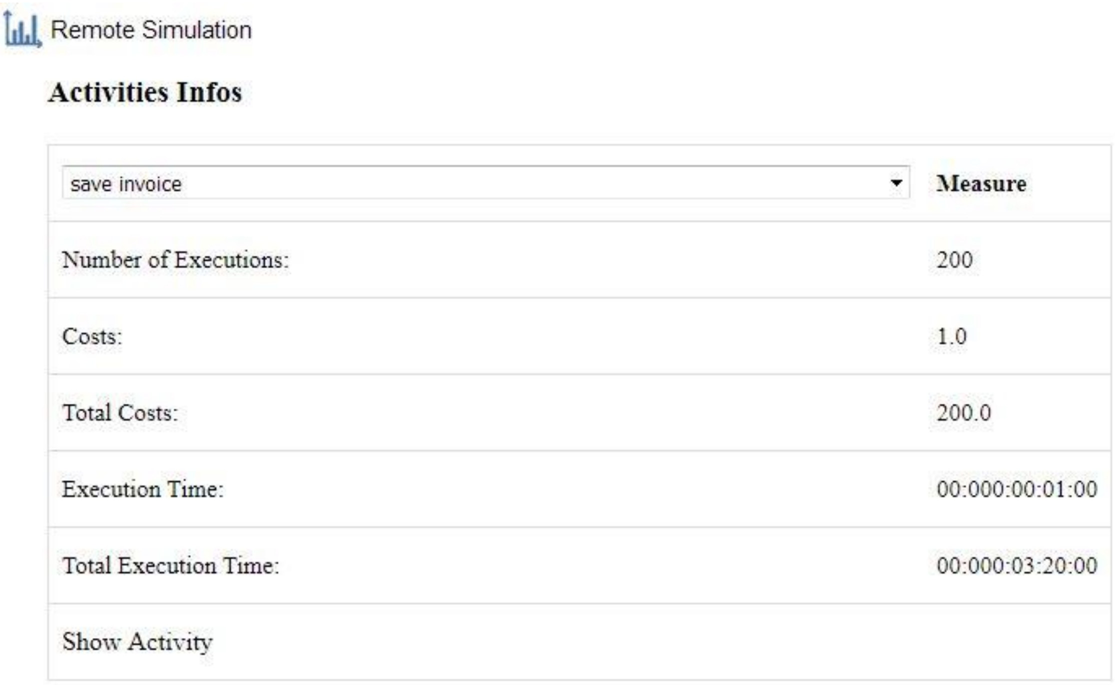


Remote Simulation

Activities Infos

save invoice ▾	Measure
Number of Executions:	200
Costs:	10.0
Total Costs:	2000.0
Execution Time:	00:000:00:10:00
Total Execution Time:	00:001:09:20:00
Show Activity	

Figure 11: Simulation results for 200 invoices /month, using SaaS manually



Remote Simulation

Activities Infos

save invoice	Measure
Number of Executions:	200
Costs:	1.0
Total Costs:	200.0
Execution Time:	00:000:00:01:00
Total Execution Time:	00:000:03:20:00
Show Activity	

Figure 12: Simulation results for 200 invoices /month, using BPaaS automatically

Table 1 gives an overview of the simulation results. Based on these results the conclusion can be drawn:

- For generating small amount of invoices per month, SaaS would be suggested
- For generating larger amount of invoices per month, BPaaS would be suggested

20 Invoices/Month						200 Invoices/Month					
Manual (SaaS)			Automatic(BPaaS)			Manual (SaaS)			Automatic(BPaaS)		
time	Personal cost	SaaS cost	time	Personal cost	BPaaS cost	time	Personal cost	SaaS cost	time	Personal cost	BPaaS cost
3h20min	200€	20€	20min	20€	300€	1day 9hours 20min	2000€	20€	3h 20min	200€	300€
Total Cost (personal cost + SaaS/BPaaS cost)											
220€			320€			2020€			500€		

Table 1: Overview of Simulation Results

3.1.5 KPI

In the Design Package, Figure 4 above, the blue KPI box denotes, a series of functions related to the overall BPaaS Design Environment. These functions are related to:

- the Evaluation Design Environment, which is integrated in the BPaaS Design Environment allowing to model goals, key performance indicators and the corresponding data sensor and query algorithms.
- the monitoring components, which are partly represented as sensors in the BPaaS Execution Environment and partly represented as the semantic repository and the corresponding analytics engine.
- the visualisation of the monitoring results in form of a cockpit, which gets the goal, key performance indicator and the corresponding semantic from the model that has been created in the design environment and combines the concrete values form the sensors that are retrieved from the BPaaS Execution Environment or the semantic analysis.

The creation of the goals and key performance indicators followed the scorecard principle, targeting the decision makers in providing meaningful, aggregated and selected figures. We distinguished between two cockpits:

- A Cockpit addressing the business decision maker
- A Cockpit addressing the technical decision maker

In the following the two cockpits are introduced.

3.1.5.1 Business Decision Maker Cockpit

When developing the cockpit we had the corresponding decision maker in mind. The key question was, who is using the cockpit and for which decision the decision maker needs support. Based on this guideline, the goals, KPIs and sensor data are designed.

The cockpit is improved over time, as it usually evolves in several directions like:

- the thresholds become more advanced
- the KPIs will be more detailed
- the mechanisms to automatically calculate KPIs will more and more exchange pure manual insertions

So, the presented cockpit is the result of some workshops and iterations, but it is expected that the cockpit evolves over the time, after several iterations with real figures and the practical need to change the aforementioned parameters.

The scorecard approach proposes to start with four perspectives, when developing a dashboard. In CloudSocket we used the scorecards to measure performance, although there may be other perspectives (e.g. finance) that are also of interest to the broker.

We are able to assess four perspectives:

1. Profit: Impact of the products and services on the customer site, hence measuring the effectivity via usage, the income or customer satisfaction.
2. Efficiency: Processes and organisational issues, hence measuring the efficiency of processes, re-use and operation figures of BPaaSes
3. Organisation: Human resources that perform the work at the broker site, hence the intellectual capital of the broker like work staff and their skills.
4. Resources: Resources that are needed by the broker, to monitor constraints and identifying bottlenecks via measuring budget, material, and information and in our case indicators about the IT infrastructure.

In Figure 13we show the business cockpit model that describes the goals (blue pyramids), sub-goals (orange circles) and the KPIs (targets) that correspond to the four perspectives (the four swim-lanes). Larger figures can be found in the Annex E – Annex H.

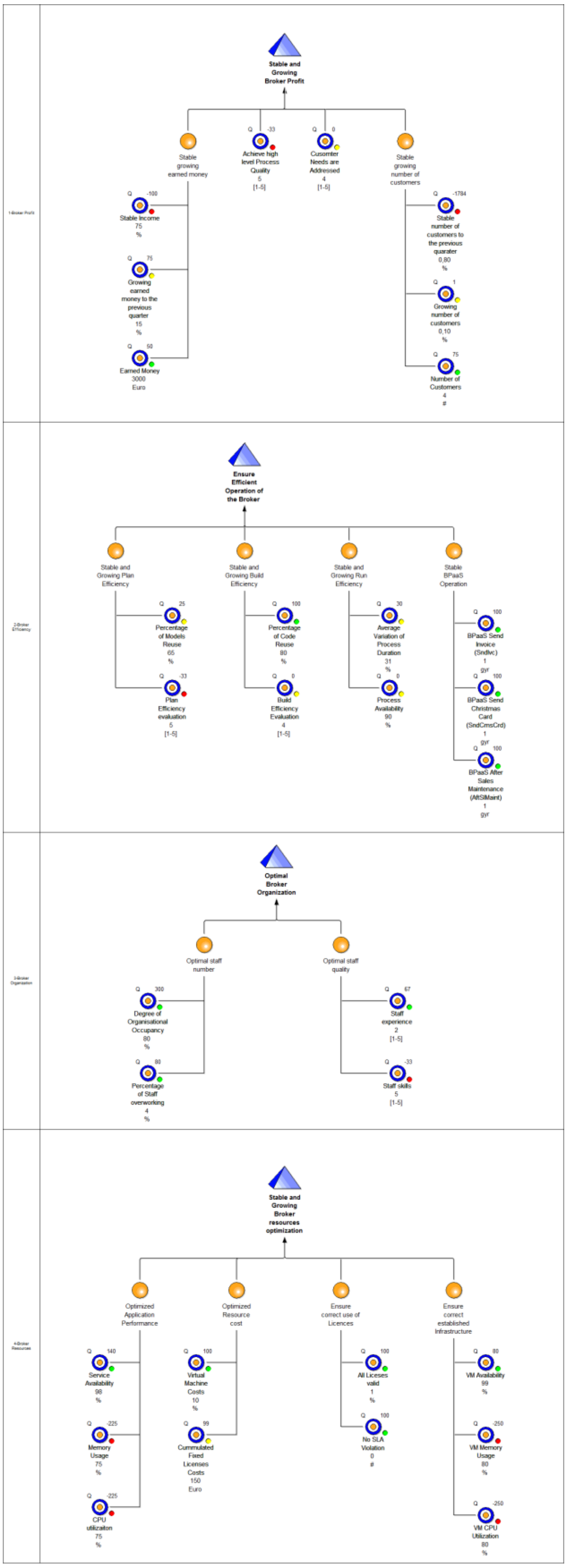

1-Broker Profit
Stable and Growing Broker Profit
Stable growing earned money
Q -33
Achieve high level Process Quality
5
[1-5]
Q 0
Cusomter Needs are Addressed
4
[1-5]
Stable growing number of customers
Q -100
Stable Income
75
%
Q 75
Growing earned money to the previous quarter
15
%
Q 50
Earned Money
3000
Euro
Q -1784
Stable number of customers to the previous quarater
0,80
%
Q 1
Growing number of customers
0,10
%
Q 75
Number of Customers
4
#
2-Broker Efficiency
Ensure Efficient Operation of the Broker
Stable and Growing Plan Efficiency
Stable and Growing Build Efficiency
Stable and Growing Run Efficiency
Stable BPaaS Operation
Q 25
Percentage of Models Reuse
65
%
Q -33
Plan Efficiency evaluation
5
[1-5]
Q 100
Percentage of Code Reuse
80
%
Q 0
Build Efficiency Evaluation
4
[1-5]
Q 30
Average Variation of Process Duration
31
%
Q 0
Process Availability
90
%
Q 100
BPaaS Send Invoice (SndIvc)
1
gyr
Q 100
BPaaS Send Christmas Card (SndCrnsCrd)
1
gyr
Q 100
BPaaS After Sales Maintenance (AftSlMaint)
1
gyr
3-Broker Organization
Optimal Broker Organization
Optimal staff number
Optimal staff quality
Q 300
Degree of Organisational Occupancy
80
%
Q 80
Percentage of Staff overworking
4
%
Q 67
Staff experience
2
[1-5]
Q -33
Staff skills
5
[1-5]
4-Broker Resources
Stable and Growing Broker resources optimization
Optimized Application Performance
Optimized Resource cost
Ensure correct use of Licences
Ensure correct established Infrastructure
Q 140
Service Availability
98
%
Q -225
Memory Usage
75
%
Q -225
CPU utilizaiton
75
%
Q 100
Virtual Machine Costs
10
%
Q 99
Cummulated Fixed Licenses Costs
150
Euro
Q 100
All Liceses valid
1
%
Q 100
No SLA Violation
0
#
Q 80
VM Availability
99
%
Q -250
VM Memory Usage
80
%
Q -250
VM CPU Utilization
80
%

Figure 13: business cockpit model

3.1.5.2 Technical Decision Maker Cockpit

In a similar way the technical dashboard has been designed – it describes also the goals (blue pyramids), sub-goals (orange circles) and the KPIs (targets) that correspond to one perspective - BPaaS. Three BPaaSes are presented: BPaaS Send Invoice, BPaaS Send Christmas, and BPaaS After Sales Maintenance. For each BPaaS the following technical parameters are assessed:

- Number of exactions
- Availability of BPaaS
- Average Execution Time
- Infrastructure Costs
- CPU usage
- Memory usage

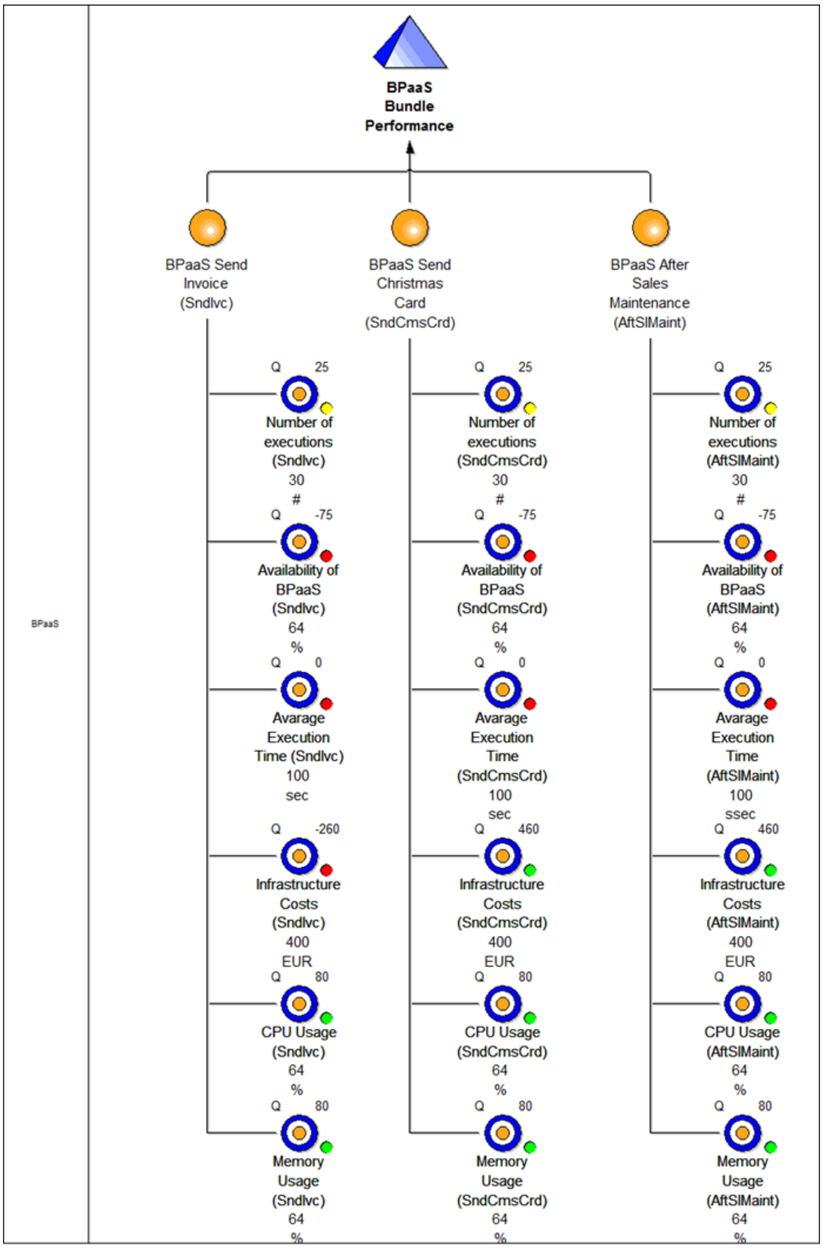

BPaaS
BPaaS Bundle Performance
BPaaS Send Invoice (SndIvc)
BPaaS Send Christmas Card (SndCmsCrd)
BPaaS After Sales Maintenance (AftSIMaint)
Q 25
Number of executions (SndIvc) 30 #
Q -75
Availability of BPaaS (SndIvc) 64 %
Q 0
Avarage Execution Time (SndIvc) 100 sec
Q -260
Infrastructure Costs (SndIvc) 400 EUR
Q 80
CPU Usage (SndIvc) 64 %
Q 80
Memory Usage (SndIvc) 64 %
Q 25
Number of executions (SndCmsCrd) 30 #
Q -75
Availability of BPaaS (SndCmsCrd) 64 %
Q 0
Avarage Execution Time (SndCmsCrd) 100 sec
Q 460
Infrastructure Costs (SndCmsCrd) 400 EUR
Q 80
CPU Usage (SndCmsCrd) 64 %
Q 80
Memory Usage (SndCmsCrd) 64 %
Q 25
Number of executions (AftSIMaint) 30 #
Q -75
Availability of BPaaS (AftSIMaint) 64 %
Q 0
Avarage Execution Time (AftSIMaint) 100 ssec
Q 460
Infrastructure Costs (AftSIMaint) 400 EUR
Q 80
CPU Usage (AftSIMaint) 64 %
Q 80
Memory Usage (AftSIMaint) 64 %

Figure 14: technical cockpit model

Those models express the broker's intension and hence define what the broker wants to see on the monitoring cockpits. Now the data sensor need to be technically integrated in order to provide the requested information. Those information is partly entered manually and partly filled automatically by accessing the cross-layer monitoring framework, which is made public in the innovation shop (D7.7) [8].

3.2 Allocation Environment - Build and Publish BPaaS bundle

The BPaaS Allocation Environment has the responsibility to provide technical details and configurations for the business processes designed in the BPaaS Design Environment, to bind them with concrete Atomic Services, Software Components and Cloud Infrastructures and to make them ready to be deployed into the Cloud. To do so, a so-called Bundle is created which contains all necessary information for deployment and execution D5.*3* [3]. A bundle contains:

- Design Package
- Marketplace Metadata, including
    - Pricing
    - Categories
    - Tags
- Deployment Information for
    - Infrastructure
    - Software Component
    - Atomic Services (SaaS)
- Information for Key Performance Indicators
- Service Level Agreement (SLA)
- Information for Adaptation

The following figure shows the different tabs for setting required information described above in order to create a bundle for Golden Worm.

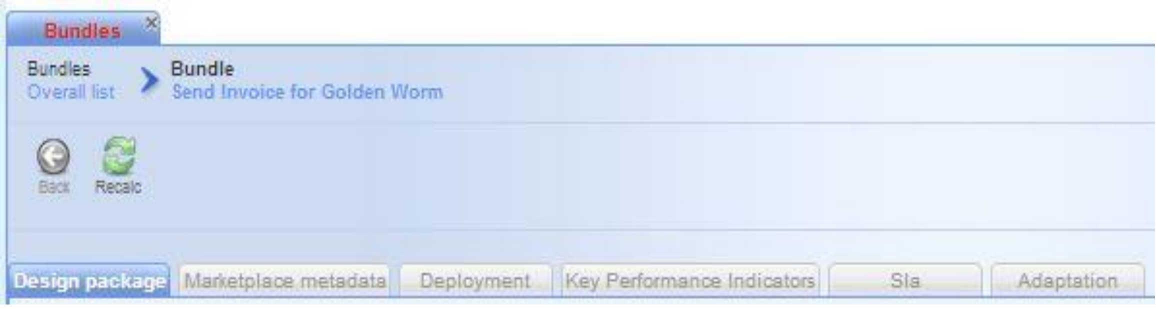
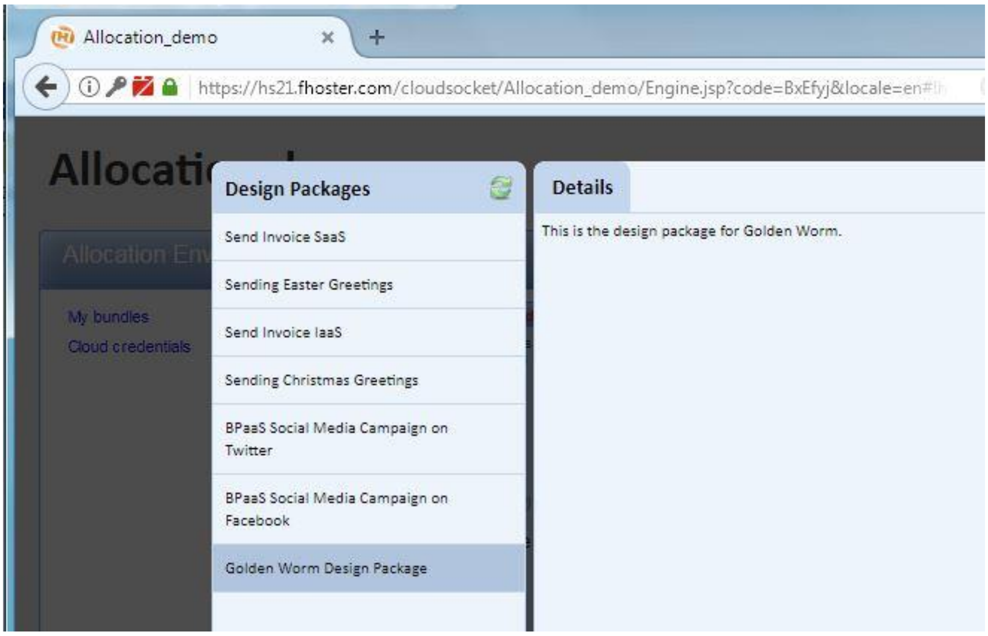


Figure 15: Figure 14 Allocation Environment – different tabs

The first step towards creation of the Golden Worm BPaaS bundle is the handover of the information created so far in the Design Environment to the Allocation Environment. This task is accomplished through the “Design package” tab of the Allocation Environment user interface.



Allocation_demo

https://hs21.fhoster.com/cloudsocket/Allocation_demo/Engine.jsp?code=BxEfyj&locale=en#

Allocati

Allocation En

My bundles
Cloud credentials

Design Packages

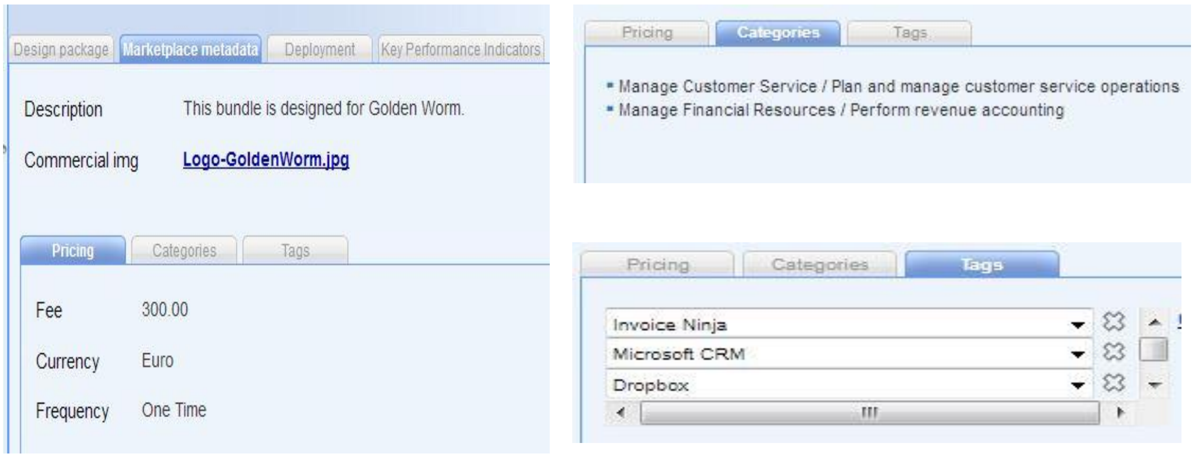
- Send Invoice SaaS
- Sending Easter Greetings
- Send Invoice IaaS
- Sending Christmas Greetings
- BPaaS Social Media Campaign on Twitter
- BPaaS Social Media Campaign on Facebook
- Golden Worm Design Package

Details

This is the design package for Golden Worm.

Figure 16 Handover of Design Package to Allocation Environment

The Marketplace metadata are information from the marketing point view, and can be seen by customers who browses the content of the bundles, which contain Pricing, Categories, and Tags like the figure below.



Description	This bundle is designed for Golden Worm.
Commercial img	Logo-GoldenWorm.jpg

Fee	300.00
Currency	Euro
Frequency	One Time

- Manage Customer Service / Plan and manage customer service operations
- Manage Financial Resources / Perform revenue accounting

Invoice Ninja
Microsoft CRM
Dropbox

Figure 17: Allocation Environment - the "Marketplace metadata" tab of the user interface

In order to complex a Deployment Plan, the Allocation Environment provides a user interface for setting all required information for bundle configuration.

A bundle binds an executable workflow with concrete Atomic Services (SaaS), Software Components, realises the functionalities of the workflow (service) tasks, and specifies the configuration of IaaS/PaaS for hosting Software Component if a software component in an executable workflow is considered.

Deployment Plan contains configurations for:

- Infrastructure
- Software Component
- Atomic Services

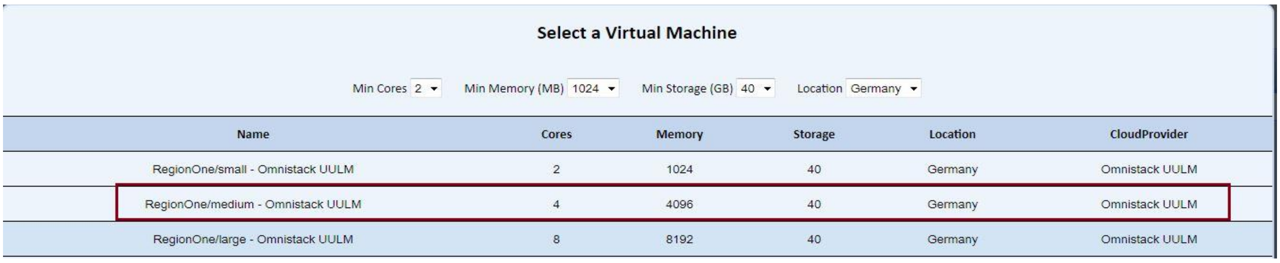
As described in the previous sections, the extended business process for Send Invoice contains three Cloud services: Microsoft CRM, Invoice Ninja and Dropbox. For workflow implementation, Microsoft CRM and Dropbox can be applied as Atomic Services (SaaS), and Invoice Ninja can be applied as Atomic Service as well as Software Component.

In this section, as an example, the Microsoft CRM is applied as Atomic Service, and the Invoice Ninja is as Software Component in order to explain how virtual machine can be selected to host Software Component.

The **Fehler! Verweisquelle konnte nicht gefunden werden.** presents how to select a virtual machine in order to match technical requirements for hosting software component. A virtual machine is described with:

- Name
- Number of Cores
- Number of Memory
- Number of Storage
- Location
- Cloud Provider

As an example for the bundle Golden Worm, a virtual machine can be selected with name “RegionOne/Medium-Omnistack-UULM”, 4 Cores vCPU, 4096MB Memory, 40GB Storage in location Germany with Omnistack UULM as Cloud provider. See Figure 18 and Figure 19

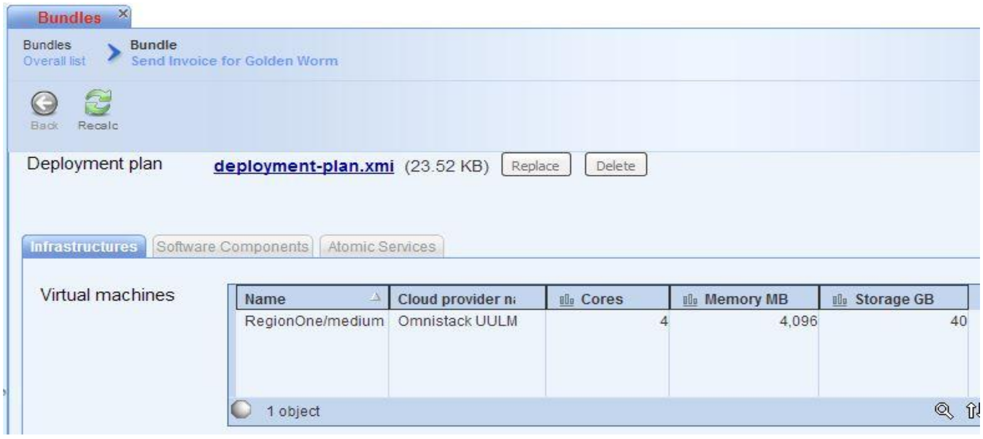


Select a Virtual Machine

Min Cores 2 ▾ Min Memory (MB) 1024 ▾ Min Storage (GB) 40 ▾ Location Germany ▾

Name	Cores	Memory	Storage	Location	CloudProvider
RegionOne/small - Omnistack UULM	2	1024	40	Germany	Omnistack UULM
RegionOne/medium - Omnistack UULM	4	4096	40	Germany	Omnistack UULM
RegionOne/large - Omnistack UULM	8	8192	40	Germany	Omnistack UULM

Figure 18: Allocation Environment - Select a Virtual Machine



Deployment plan deployment-plan.xmi (23.52 KB) Replace Delete

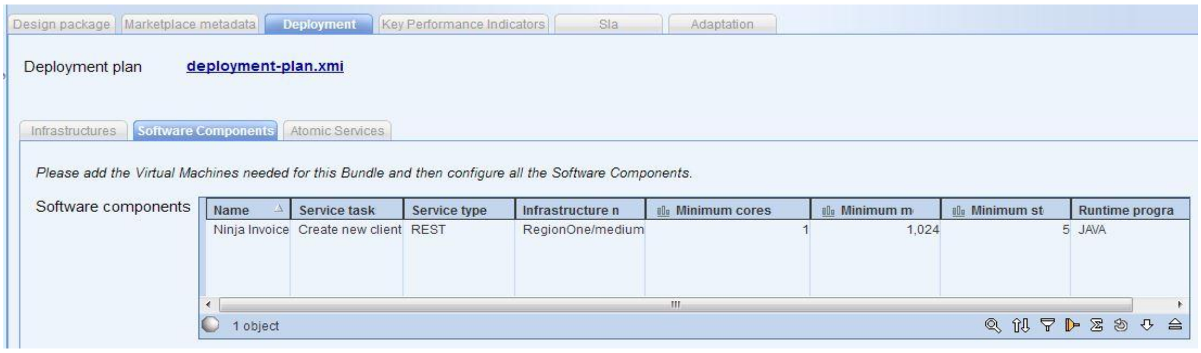
Virtual machines

Name	Cloud provider n	Cores	Memory MB	Storage GB
RegionOne/medium	Omnistack UULM	4	4,096	40

1 object

Figure 19: Allocation Environment - Deployment plan, the “Infrastructures” tab

Figure 20 shows under the tab “Software Components” the information for configuring the Software Component “Ninja Invoice”, which supports REST interface, can be deployed in the Infrastructure/virtual machine RegionOne/Medium Omnistack-UULM.



Deployment plan deployment-plan.xmi

Please add the Virtual Machines needed for this Bundle and then configure all the Software Components.

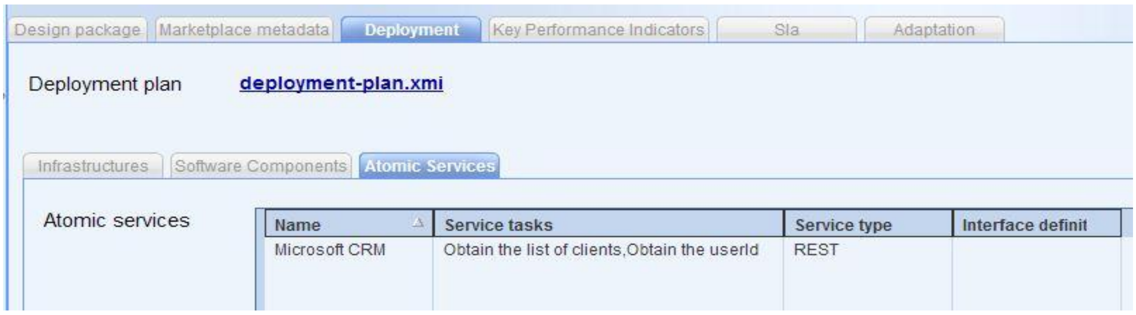
Software components

Name	Service task	Service type	Infrastructure n	Minimum cores	Minimum m	Minimum st	Runtime progra
Ninja Invoice	Create new client	REST	RegionOne/medium	1	1,024	5	JAVA

1 object

Figure 20: Allocation Environment - Deployment plan, Software Components: Ninja Invoice

Figure 21 presents information for configuring of the Atomic Service Microsoft CRM, which also supports REST interface, and can be involved by the Workflow Engine in the Execution Environment for the service task “ Obtain the list of Clients, obtain the userID”



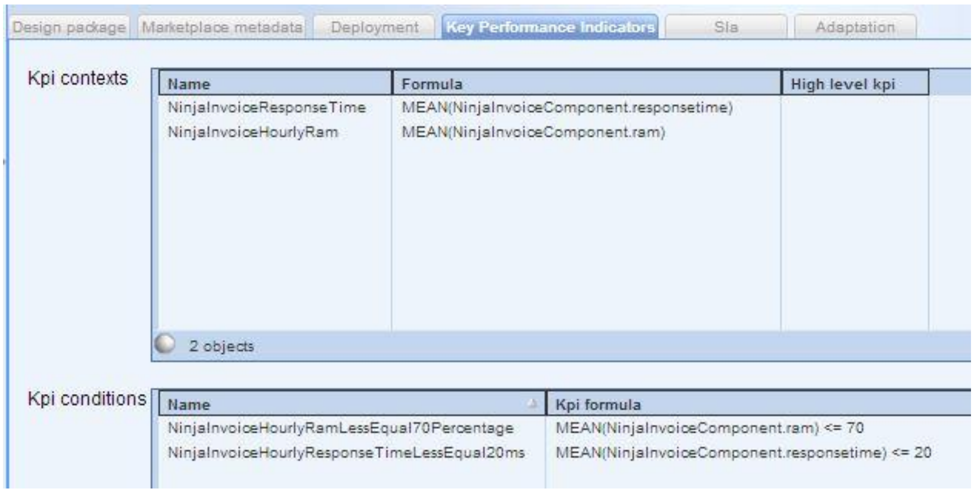
Deployment plan deployment-plan.xmi

Atomic services

Name	Service tasks	Service type	Interface definit
Microsoft CRM	Obtain the list of clients,Obtain the userId	REST	

Figure 21: Allocation Environment - Deployment plan, Atomic Services

Figure 22 shows configuration for KPI metrics, which are wrapped in a CAMEL file, and transferred within the bundle to the Execution Environment for monitoring system.



Kpi contexts

Name	Formula	High level kpi
NinjaInvoiceResponseTime	MEAN(NinjaInvoiceComponent.responsetime)	
NinjaInvoiceHourlyRam	MEAN(NinjaInvoiceComponent.ram)	

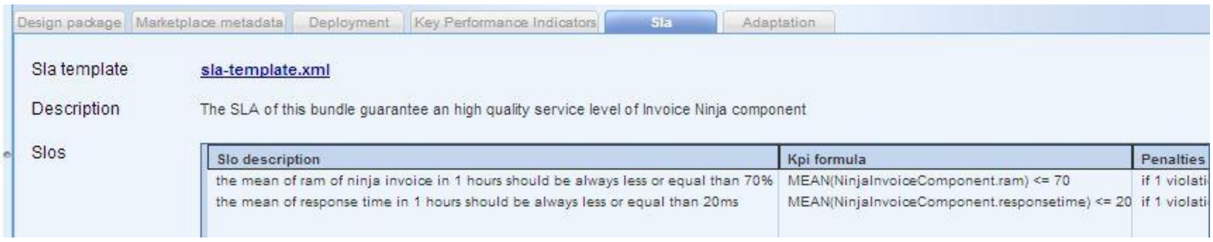
2 objects

Kpi conditions

Name	Kpi formula
NinjaInvoiceHourlyRamLessEqual70Percentage	MEAN(NinjaInvoiceComponent.ram) <= 70
NinjaInvoiceHourlyResponseTimeLessEqual20ms	MEAN(NinjaInvoiceComponent.responsetime) <= 20

Figure 22: Allocation Environment - Key Performance Indicators

The service level agreement (SLA) is a part of the contract between the broker and the customer buying and executing a BPaaS Bundle, It can be specified in the Allocation Environment.



Sla template sla-template.xml

Description The SLA of this bundle guarantee an high quality service level of Invoice Ninja component

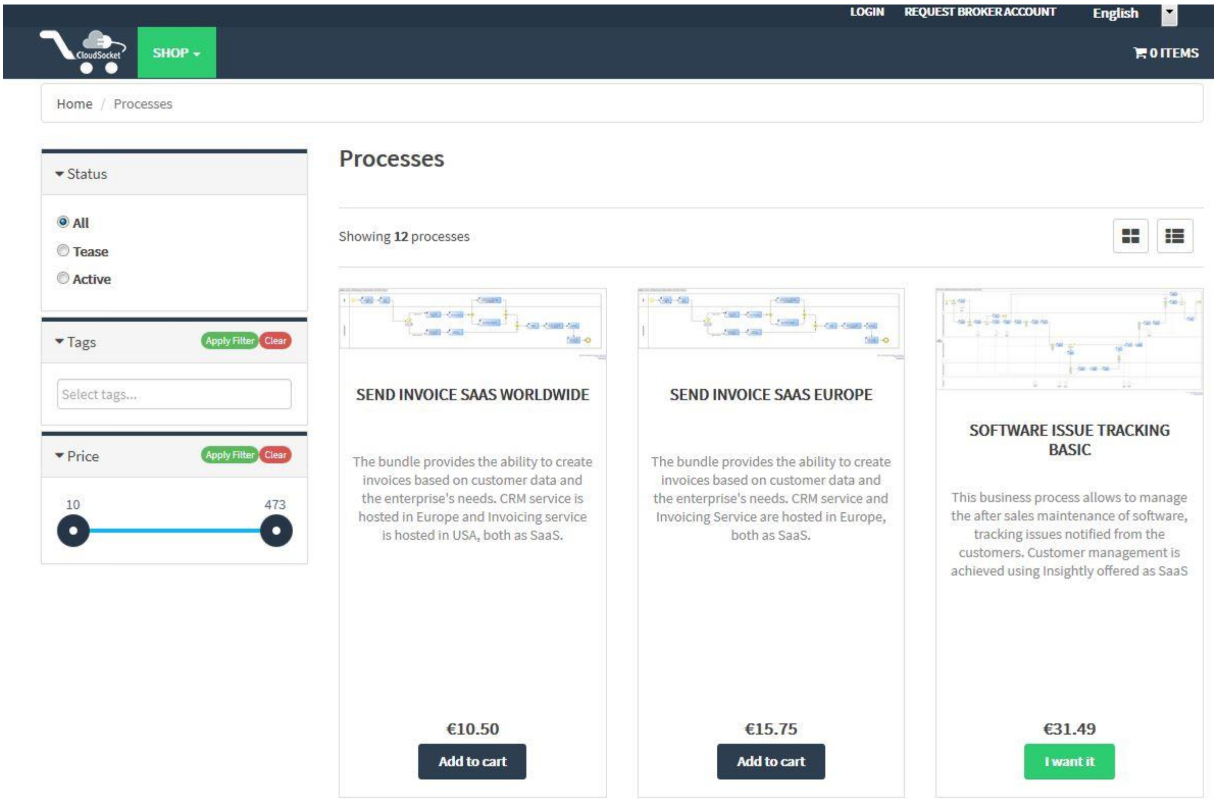
Slos

Slo description	Kpi formula	Penalties
the mean of ram of ninja invoice in 1 hours should be always less or equal than 70%	MEAN(NinjaInvoiceComponent.ram) <= 70	if 1 violati
the mean of response time in 1 hours should be always less or equal than 20ms	MEAN(NinjaInvoiceComponent.responsetime) <= 20	if 1 violati

Figure 23: Allocation Environment - SLA

4 PURCHASE AND EXECUTE BPAAS

The BPaaS Marketplace publishes business processes provided by the brokers. Potential customers can browser and analyse the processes and contact the responsible broker when they are interested in a business process.



Processes

Showing 12 processes

SEND INVOICE SAAS WORLDWIDE

The bundle provides the ability to create invoices based on customer data and the enterprise's needs. CRM service is hosted in Europe and Invoicing service is hosted in USA, both as SaaS.

€10.50

Add to cart

SEND INVOICE SAAS EUROPE

The bundle provides the ability to create invoices based on customer data and the enterprise's needs. CRM service and Invoicing Service are hosted in Europe, both as SaaS.

€15.75

Add to cart

SOFTWARE ISSUE TRACKING BASIC

This business process allows to manage the after sales maintenance of software, tracking issues notified from the customers. Customer management is achieved using Insightly offered as SaaS

€31.49

I want it

Figure 24: Marketplace

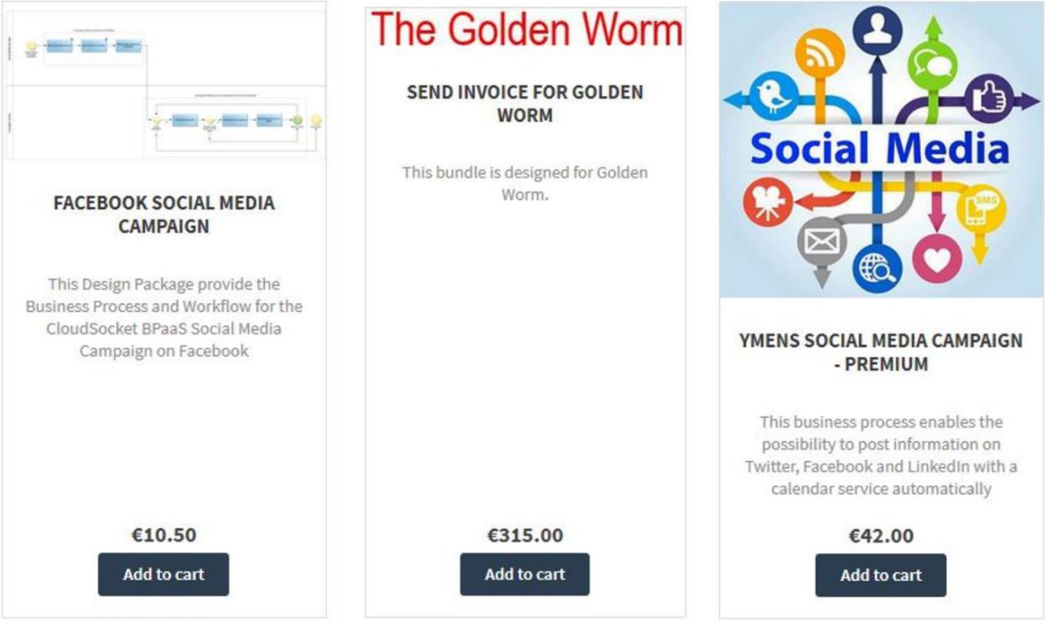
There are three types of processes offered and published on the Marketplace:

- Executable business process:

  This is called BPaaS bundle. A customer can buy it. The bundle can be deployed automatically into the Cloud infrastructure, and it ready to be used. These bundles are marked as "Add to cart" like Figure 25
- Abstract Workflow:

  Abstract workflows are created out of any business processes that describe the intention of the business designer on such level that the development of workflows as well as the allocation to concrete cloud offerings can be performed. As a consequence, the BPaaS Marketplace enables the advertising of abstract workflows that cannot be executed, but are offered as potential BPaaS bundles D5.2 [1]. These workflows are marked as "I want it" like Figure 26
- SaaS:

  SaaS offerings are 3rd party services which can be combined with existing BPaaS to provide low priced solution for start-ups and small companies based on price simulation result which are described in the section 3.1.4. SaaS offerings are marked as "I want it" like Figure 27



FACEBOOK SOCIAL MEDIA CAMPAIGN

This Design Package provide the Business Process and Workflow for the CloudSocket BPaaS Social Media Campaign on Facebook

€10.50

SEND INVOICE FOR GOLDEN WORM

This bundle is designed for Golden Worm.

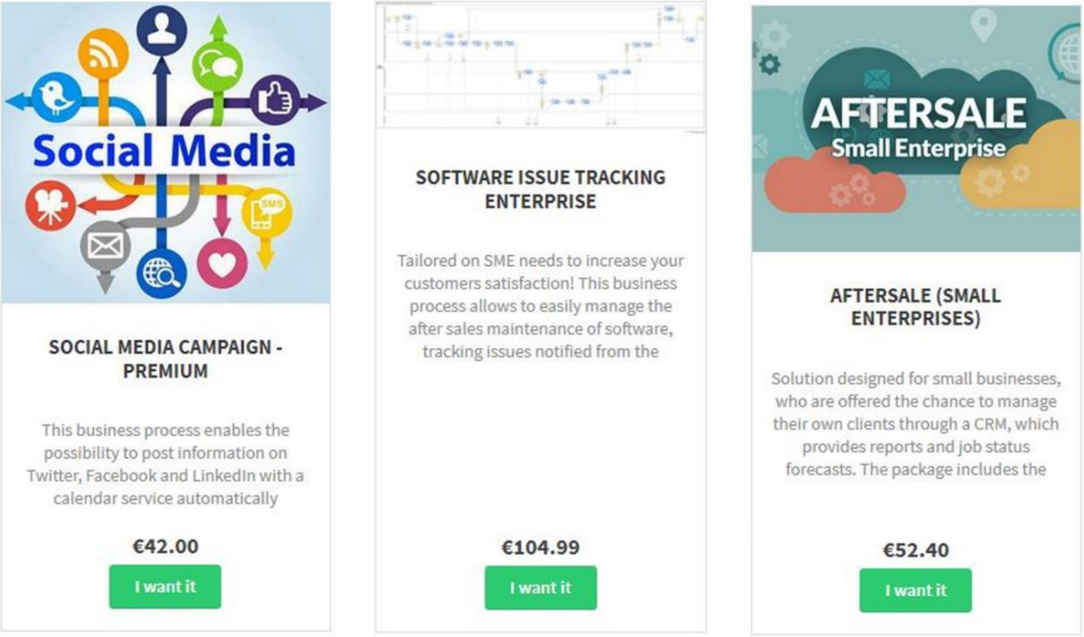
€315.00

YMENS SOCIAL MEDIA CAMPAIGN - PREMIUM

This business process enables the possibility to post information on Twitter, Facebook and LinkedIn with a calendar service automatically

€42.00

Figure 25: Examples of BPaaS offerings on the Marketplace



SOCIAL MEDIA CAMPAIGN - PREMIUM

This business process enables the possibility to post information on Twitter, Facebook and LinkedIn with a calendar service automatically

€42.00

SOFTWARE ISSUE TRACKING ENTERPRISE

Tailored on SME needs to increase your customers satisfaction! This business process allows to easily manage the after sales maintenance of software, tracking issues notified from the

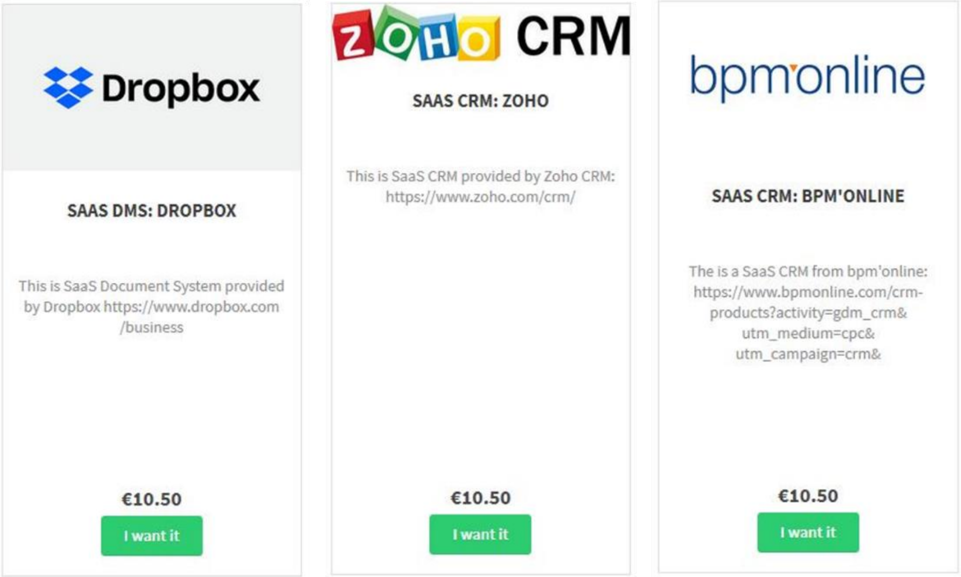
€104.99

AFTERSALE (SMALL ENTERPRISES)

Solution designed for small businesses, who are offered the chance to manage their own clients through a CRM, which provides reports and job status forecasts. The package includes the

€52.40

Figure 26: Examples of Abstract Workflow offerings on the Marketplace



Dropbox

SAAS DMS: DROPBOX

This is SaaS Document System provided by Dropbox https://www.dropbox.com /business

€10.50

I want it

ZOHO CRM

SAAS CRM: ZOHO

This is SaaS CRM provided by Zoho CRM: https://www.zoho.com/crm/

€10.50

I want it

bpm'online

SAAS CRM: BPM'ONLINE

The is a SaaS CRM from bpm'online: https://www.bpmonline.com/crm-products?activity=gdm_crm&utm_medium=cpc&utm_campaign=crm&

€10.50

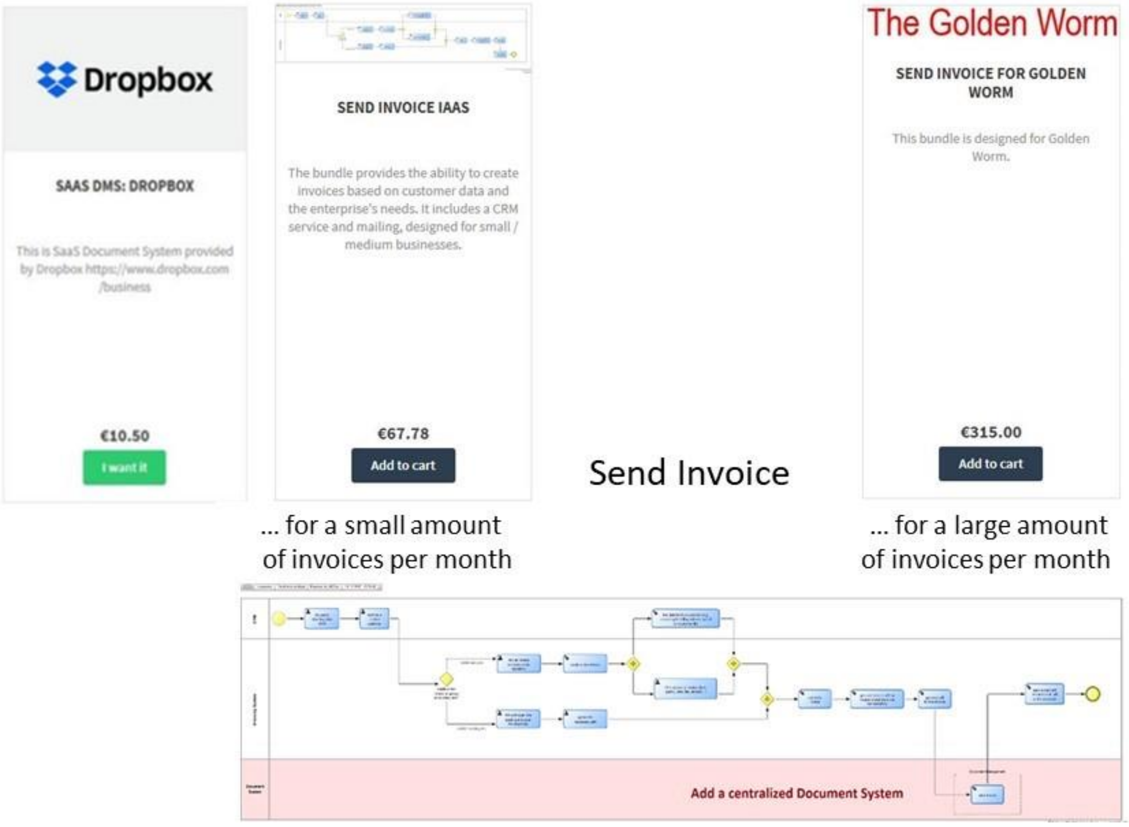
I want it

Figure 27: Examples of SaaS offerings on the Marketplace

4.1 Purchase the bundle The Golden Worm

Based on the conclusion of the simulation which is described in the section 3.1.4, for start-ups and companies who generate small number of invoices each month, it would be recommend to use Dropbox as SaaS together with the existing BPaaS of Send Invoice. For companies who generate large number of invoices each month, it would be recommend integrating Dropbox into a new BPaaS bundle.

In the scenario of the Golden warm example, there will be a large number of invoices in the coming year, such that Dropbox with a BPaaS bundle shall be purchased.



Dropbox

SAAS DMS: DROPBOX

This is SaaS Document System provided by Dropbox https://www.dropbox.com /business

€10.50

I want it

SEND INVOICE IAAS

The bundle provides the ability to create invoices based on customer data and the enterprise's needs. It includes a CRM service and mailing, designed for small / medium businesses.

€67.78

Add to cart

The Golden Worm

SEND INVOICE FOR GOLDEN WORM

This bundle is designed for Golden Worm.

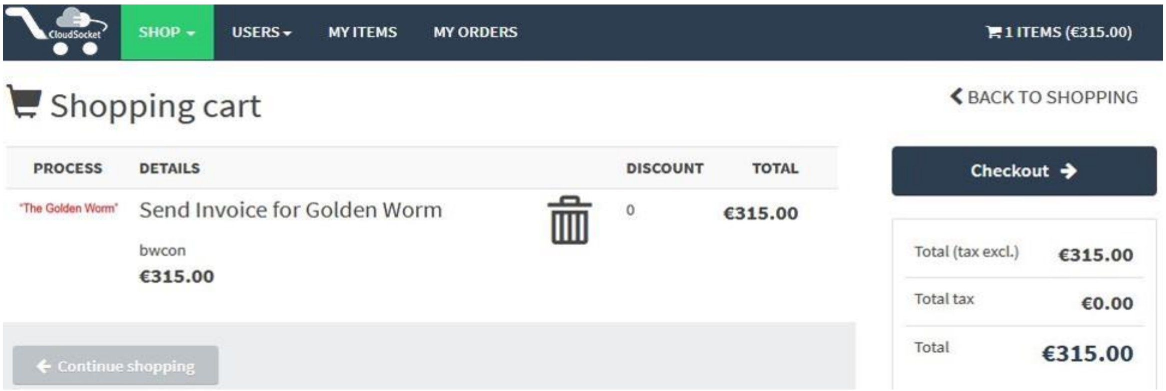
€315.00

Add to cart

Send Invoice
... for a small amount of invoices per month
... for a large amount of invoices per month
Add a centralized Document System

Figure 28: Usage of Dropbox as SaaS and BPaaS

The bundle “The Golden Worm” can be purchased on the marketplace after pressing the button “Add to Cart”.



Shopping cart

PROCESS	DETAILS	DISCOUNT	TOTAL
"The Golden Worm"	Send Invoice for Golden Worm bwcon €315.00	0	€315.00

Total (tax excl.)	€315.00
Total tax	€0.00
Total	€315.00

Figure 29: purchase the bundle The Golden Worm

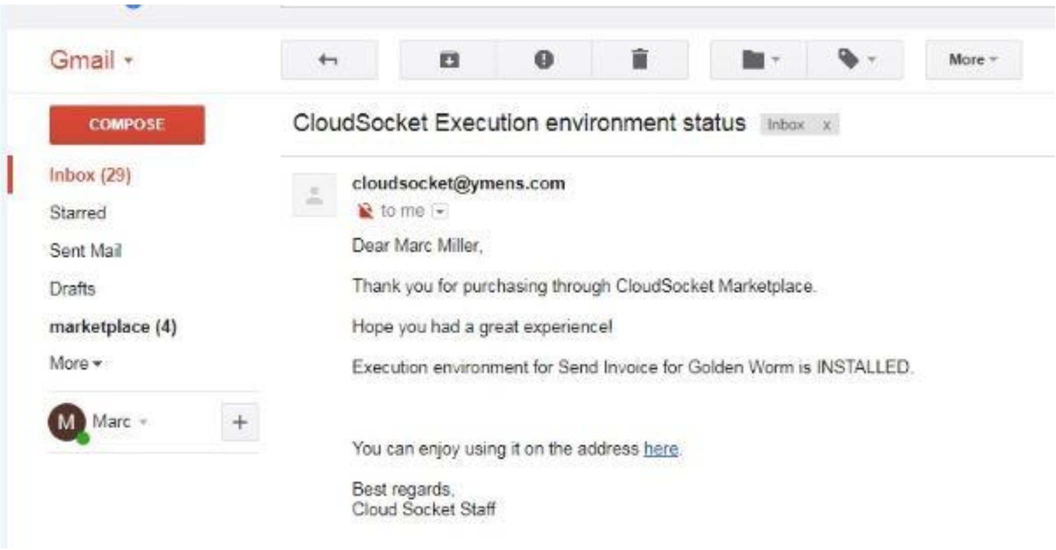
The purchased bundle can be used by the accountants in the Golden Worm. The next section presents this.

4.2 Execute the bundle The Golden Worm

The BPaaS Execution Environment enables managing, monitoring and adapting the execution of the BPaaS bundles, which have been purchased in the Marketplace. The environment covers all the steps involved in the execution phase, see D4.6-D4.7-D4.8 [2]:

- deploy and configure all components and monitoring sensors required to execute the bundles, which comprise the workflow, SLA, adaptation rules, and details of the third-party services involved;
- allow to manage the BPaaS Customer’s workflow instances, when the workflow of a BPaaS bundle has been deployed;
- visualise the conformance levels to associated agreements and the respective monitoring data;
- Generate and manage the violations incurred as well as trigger the respective BPaaS bundle adaptation rules, allowing the environment to adapt the BPaaS instances to maintain the promised service level.

After purchase of the bundle, the bundle can be installed automatically into the Execution Environment, and an e-mail notification can be sent subsequently to the buyer, see the figure below.



CloudSocket Execution environment status

cloudsocket@ymens.com
to me

Dear Marc Miller,

Thank you for purchasing through CloudSocket Marketplace.

Hope you had a great experience!

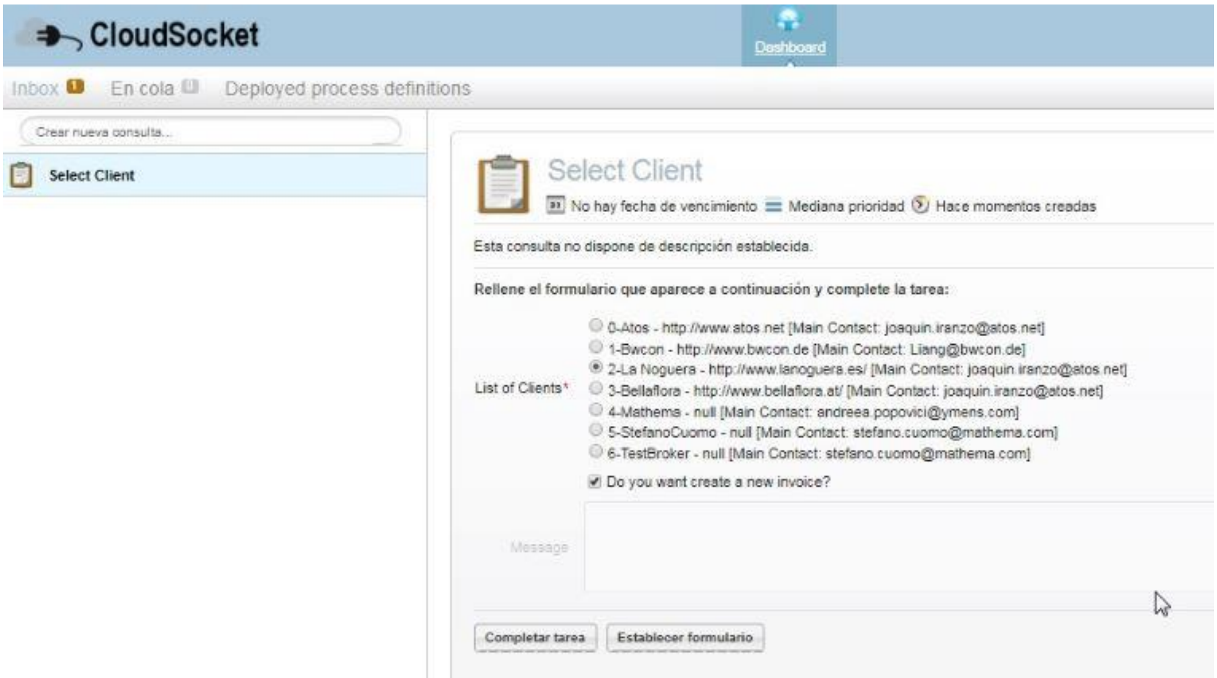
Execution environment for Send Invoice for Golden Worm is INSTALLED.

You can enjoy using it on the address here.

Best regards,
Cloud Socket Staff

Figure 30: Notification e-mail sent by the Execution Environment

The bundle is ready to be used, see Figure 31. An accountant can select a customer and create a new invoice for him.



Select Client

No hay fecha de vencimiento · Mediana prioridad · Hace momentos creadas

Esta consulta no dispone de descripción establecida.

Rellene el formulario que aparece a continuación y complete la tarea:

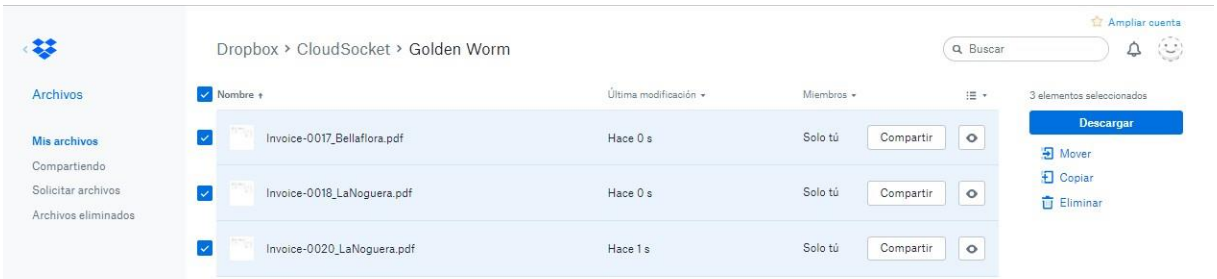
List of Clients*
○ 0-Atos - http://www.atos.net [Main Contact: joaquin.iranzo@atos.net]
○ 1-Bwcon - http://www.bwcon.de [Main Contact: Liang@bwcon.de]
● 2-La Noguera - http://www.lanoguera.es/ [Main Contact: joaquin.iranzo@atos.net]
○ 3-Bellaflora - http://www.bellaflora.at/ [Main Contact: joaquin.iranzo@atos.net]
○ 4-Mathema - null [Main Contact: andreea.popovici@ymens.com]
○ 5-StefanoCuomo - null [Main Contact: stefano.cuomo@mathema.com]
○ 6-TestBroker - null [Main Contact: stefano.cuomo@mathema.com]

☑ Do you want create a new invoice?

Message

Figure 31: Select Customer and generate Invoice

As described in the final demo scenario, a new business requirement in the extended business process is to have a separate, centralized storage to save all invoices together in one location, and based on the previous sections, the Drobox is selected and integrated into the new bundle. Figure 32 presents the invoices of Golden Worm saved together in Dropbox.



Dropbox › CloudSocket › Golden Worm

Nombre	Última modificación	Miembros	
☑ Invoice-0017_Bellaflora.pdf	Hace 0 s	Solo tú	Compartir
☑ Invoice-0018_LaNoguera.pdf	Hace 0 s	Solo tú	Compartir
☑ Invoice-0020_LaNoguera.pdf	Hace 1 s	Solo tú	Compartir

3 elementos seleccionados

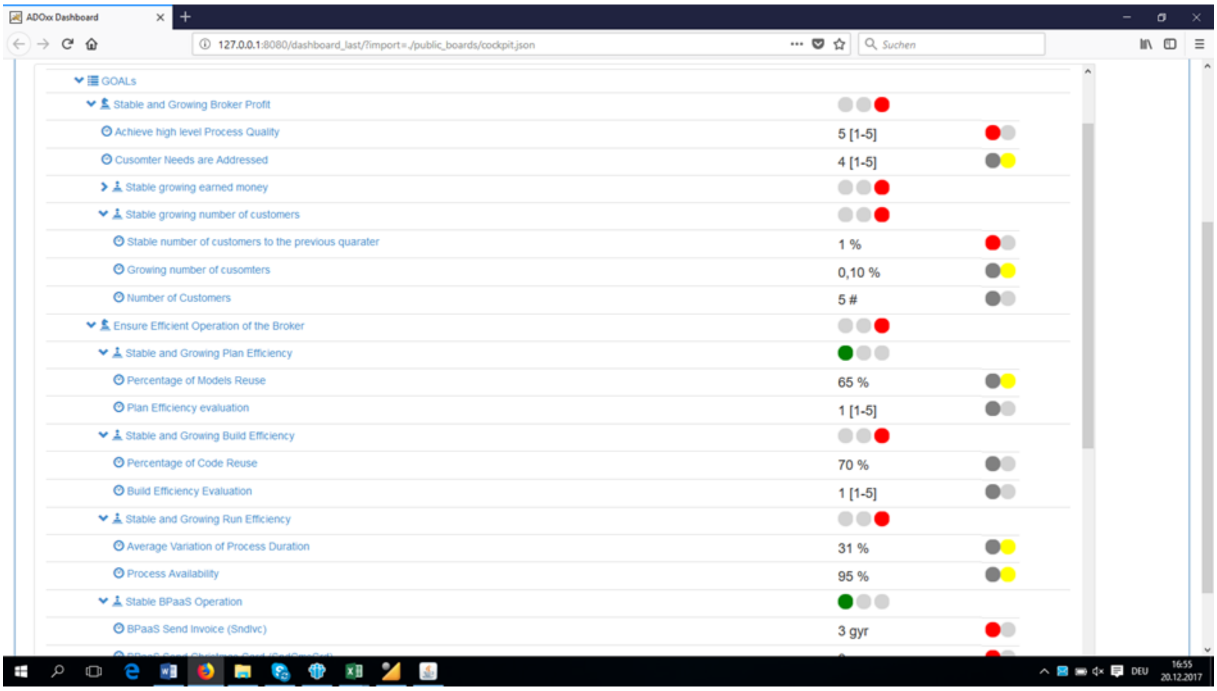
Figure 32: Separate, centralized storage

4.3 Evaluation - Monitor the BPaaS Bundle Operations

The BPaaS Evaluation Environment is the counterpart of the BPaaS Design and Allocation Environments by abstracting monitoring information from the execution of the BPaaS back onto the business layer. Semantic mechanisms are used to abstract sensor information that is harvested from different layers back to business relevant Key Performance Indictors [7].

4.3.1 Business and Technical Dashboard

The following figure shows the business dashboard.



127.0.0.1:8080/dashboard_last/?import=./public_boards/cockpit.json

GOALs			
Stable and Growing Broker Profit		⚪⚪🔴	
Achieve high level Process Quality	5 [1-5]		🔴⚪
Cusomter Needs are Addressed	4 [1-5]		⚫🟡
Stable growing earned money		⚪⚪🔴	
Stable growing number of customers		⚪⚪🔴	
Stable number of customers to the previous quarater	1 %		🔴⚪
Growing number of cusomters	0,10 %		⚫🟡
Number of Customers	5 #		⚫⚪
Ensure Efficient Operation of the Broker		⚪⚪🔴	
Stable and Growing Plan Efficiency		🟢⚪⚪	
Percentage of Models Reuse	65 %		⚫🟡
Plan Efficiency evaluation	1 [1-5]		⚫⚪
Stable and Growing Build Efficiency		⚪⚪🔴	
Percentage of Code Reuse	70 %		⚫⚪
Build Efficiency Evaluation	1 [1-5]		⚫⚪
Stable and Growing Run Efficiency		⚪⚪🔴	
Average Variation of Process Duration	31 %		⚫🟡
Process Availability	95 %		⚫🟡
Stable BPaaS Operation		🟢⚪⚪	
BPaaS Send Invoice (SndIvc)	3 gyr		🔴⚪

Figure 33: Business Dashboard

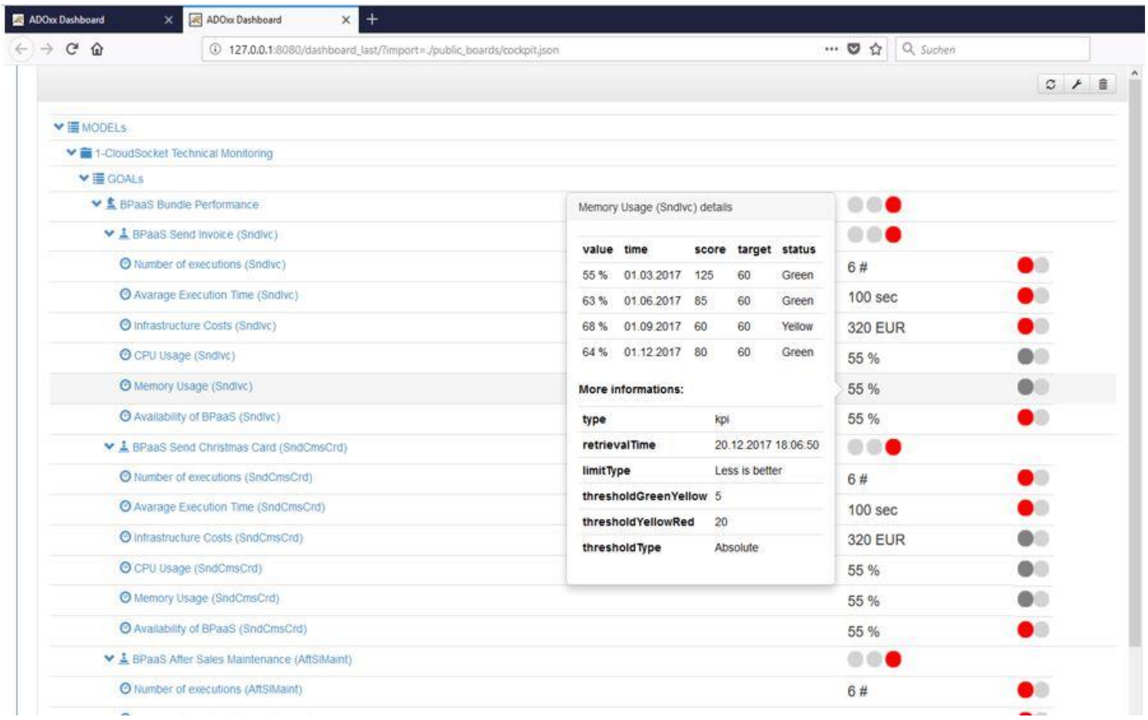
This is the monitoring device for the business decision maker that looks at KPIs that are either:

- a combination of technical calculation (e.g. summing up, building average of ICT parameters) number of SLA breaches
- a mapping of a domain KPI to something that is closed to the intended output. Trust == maps to == all IPs are in Europe (which is not 100% what we want, but the best we can do for now)

- a totally independent data entry either from human or something else (e.g. personal estimation of Mr. X, figures coming from the accounting or marketing) Customer Feedback on the applicability of the BPaaSes

Figure 34 presents a technical dashboard, which targets the IT administrator of the broker but not priory the business decision maker. Technical monitoring KPIs, which had been suggested by cloud experts, have been specified, although a selection of a huge number of interesting KPIs needed to be performed.

This KPIs are automatically filled by the cross-layer monitoring framework, which was adapted by experts in the monitoring environment.


ADOxx Dashboard
ADOxx Dashboard
127.0.0.1:8080/dashboard_last/?import=./public_boards/cockpit.json
Suchen

MODELs	
1-CloudSocket Technical Monitoring	
GOALs	
BPaaS Bundle Performance	
BPaaS Send Invoice (SndIvc)	
Number of executions (SndIvc)	6 #
Avarage Execution Time (SndIvc)	100 sec
Infrastructure Costs (SndIvc)	320 EUR
CPU Usage (SndIvc)	55 %
Memory Usage (SndIvc)	55 %
Availability of BPaaS (SndIvc)	55 %
BPaaS Send Christmas Card (SndCmsCrd)	
Number of executions (SndCmsCrd)	6 #
Avarage Execution Time (SndCmsCrd)	100 sec
Infrastructure Costs (SndCmsCrd)	320 EUR
CPU Usage (SndCmsCrd)	55 %
Memory Usage (SndCmsCrd)	55 %
Availability of BPaaS (SndCmsCrd)	55 %
BPaaS After Sales Maintenance (AftSlMaint)	
Number of executions (AftSlMaint)	6 #

Memory Usage (SndIvc) details

value	time	score	target	status
55 %	01.03.2017	125	60	Green
63 %	01.06.2017	85	60	Green
68 %	01.09.2017	60	60	Yellow
64 %	01.12.2017	80	60	Green

More informations:

type	kpi
retrievalTime	20.12.2017 18:06:50
limitType	Less is better
thresholdGreenYellow	5
thresholdYellowRed	20
thresholdType	Absolute

Figure 34: technical dashboard

5 FEEDBACK TO IMPLEMENTATION AND RESEARCH

This chapter gives a short feedback both from a CloudSocket broker's and a more general point of view to implementers and researchers interested in CloudSocket.

To begin with, from a broker's point of view, the key concern definitely is usability: therefore, for all his interfaces, i.e. the set of existing dashboards, such as the Monitoring Dashboard, SLA Dashboard etc. (see Annex D:), there should be a comprehensive single entry point for the broker.

Secondly, a technical issue of potential interest to the/a broker-consultant is the following: The mapping and transfer from Abstract/Concrete Workflow into an Executable Workflow – right now an workflow engine specific one - is challenging and requires expert know-how of consultancies. Maybe the situation could be improved in the future via a transformation of the Abstract Workflow, which can be regarded as a platform independent model (PIM), into the platform specific model (PSM) of Executable Workflow by using query/view/transformations (QVT). That could a have similar effect as the mapping of business process into abstract workflow using Semantic Lifting and the Context Adaptive Questionnaire.

Third, as the four CloudSocket environments are representing a feedback loop allowing for "learning from experience", this goal possibly could be (even more) supported by semantic integration of the knowledge bases of the Semantic Lifting/Context Adaptive Questionnaire, i.e. the Triple Store for Abstract Workflows, and the Service Repository for Executable Workflows. Admittedly involving the construction of a huge knowledge base, the potential gain in efficiency is probably worth the effort.

Finally, a more general, not broker-specific feedback is the following: To support run-time additivity of a CloudSocket BPaaS "instance", CAMEL, the Cloud Application Modelling and Execution Language leverages the concept of an "instance model", see Models@runtime, IEEE Computer 42, 10, October 2009. CAMEL protagonists active in the OASIS TOSCA (Topology and Orchestration Specification for Cloud Applications) context successfully transferred this concept into a TOSCA working group. Given this success, CloudSocket minded researchers should follow the related future evolution and its significance for CAMEL.

6 SUMMARY AND CONCLUSIONS

Towards the end of the project this deliverable has shown a complete walk-through of all the four phases and their corresponding environments – design, allocation, marketplace/execution and evaluation – which support the full lifecycle of CloudSocket.

This walkthrough was carried-out as a consultation between the envisioned paradigmatic CloudSocket broker and a "CEO" of a company in an assumed scenario, when the company has grown from a start-up towards "enterprise" scale. The related business process of the initial start-up has been extended in the BPaaS Design Environment according to new requirements and was successfully promoted towards BPaaS Allocation, Marketplace/BPaaS Execution and BPaaS Evaluation Environments.

The following conclusions can be drawn:

All technical building blocks, required for the realization of the above walkthrough have been provided, however, the overall integration of KPI specifications, from design to allocation (KPI matrices in CAMEL file), then deployed in the execution environment for monitoring system, in the end to be evaluated in the evaluation environment, address a challenging topic, which needs additional lessons learned to enable an smooth and intuitive interaction.

While individual partners of the project have shown strong interest in the exploitation of products and services, the corresponding pivotal role of a CloudSocket broker needs further elaboration. At project's end the broker is confronted with a set of expert tools, which require training and in-depth knowledge. Hence, the role of the broker is a potential new job description, with the expectation to bridge expert knowledge from many fields. The proof that this is conceptually and technically possible has been successfully achieved, now it is a challenge to find the appropriate mix between training, consulting or simplification of the approach and tools to find a reasonable balance for every day work.

In particular, instead of using the whole platform an iterative usage of individual environments together with a close cooperation of the tool vendors, is seen as a reasonable approach to use the results and to slowly move from current market to the targeted new BPaaS Broker market.

Finally, it should be mentioned that for CloudSocket as a "multi-provider enterprise" contractual issues between the related project partners are of key importance. The CloudSocket project has prepared this path with the joint business model canvases, the approach of coordinated value networks lead by the business champion, the memorandum of understanding and the corresponding partner contracts. These are understood as an approach to target the need of the broker to gain trust and business reliability.

7 REFERENCES

[1] CloudSocket D5.2, BPaaS Reference Models, June 30. 2016

[2] CloudSocket_D4.6_D4.7_D4_8, June 14 2017

[3] CloudSocket D5.3, BPaaS Allocation, June 30 2016

[4] CloudSocket D3.2, Modelling Prototypes for BPaaS, June 30 2016

[5] CloudSocket D8.4, Training Platform, December 31 2017

[6] CloudSocket D6.2, Knowledge Provision for CloudSocket, December 31 2017

[7] CloudSocket Training Platform, 5-BPaaS Evaluation, https://site.cloudsocket.eu/cloudsocket-training-portal/-/asset_publisher/l0RQCGr8dds4/content/bpaas-evaluati-1

[8] CloudSocket D7.7, Innovation Shop, https://site.cloudsocket.eu/cloudsocket-innovation-shop, acces: 22.12.2017

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ANNEX A: CLOUDSOCKET ARCHITECTURE

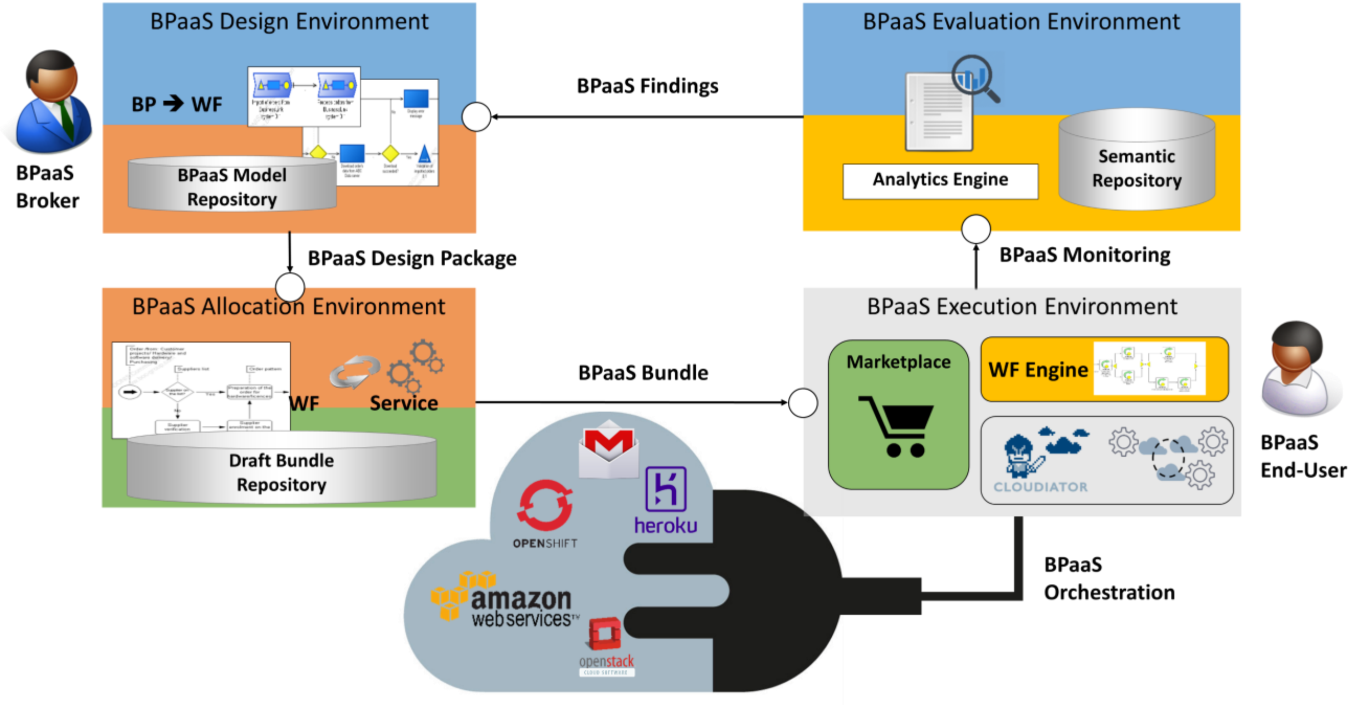
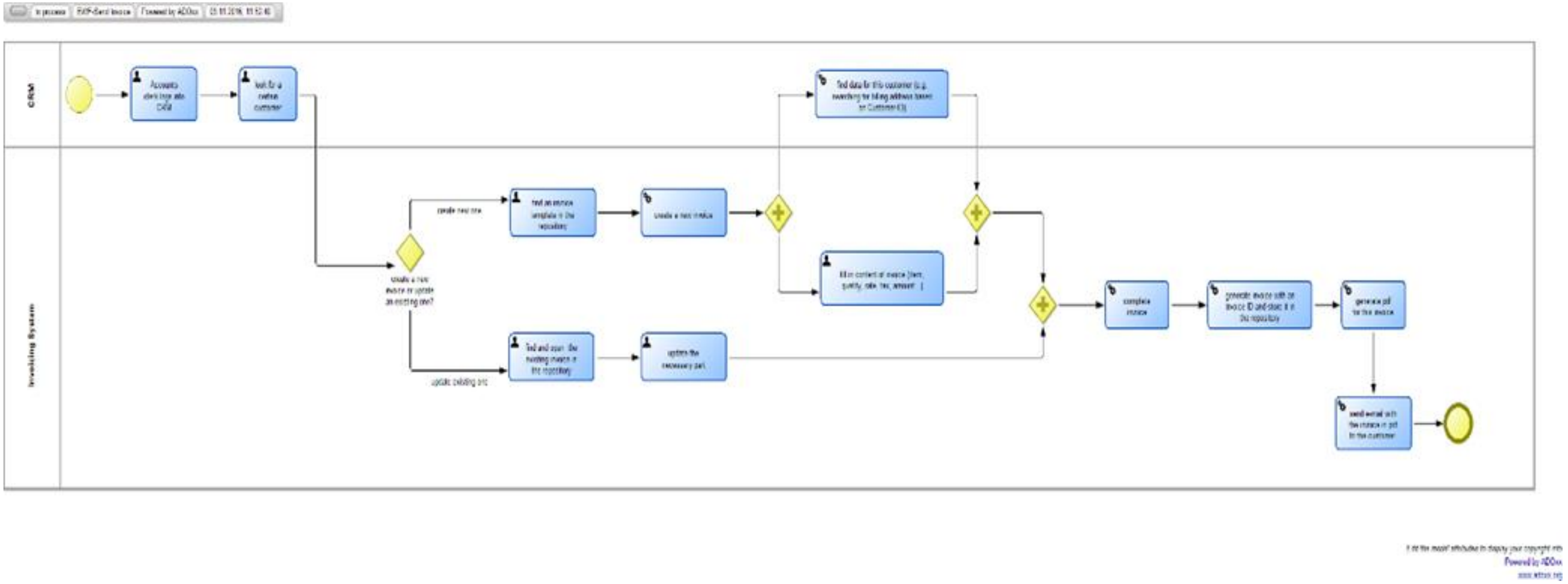
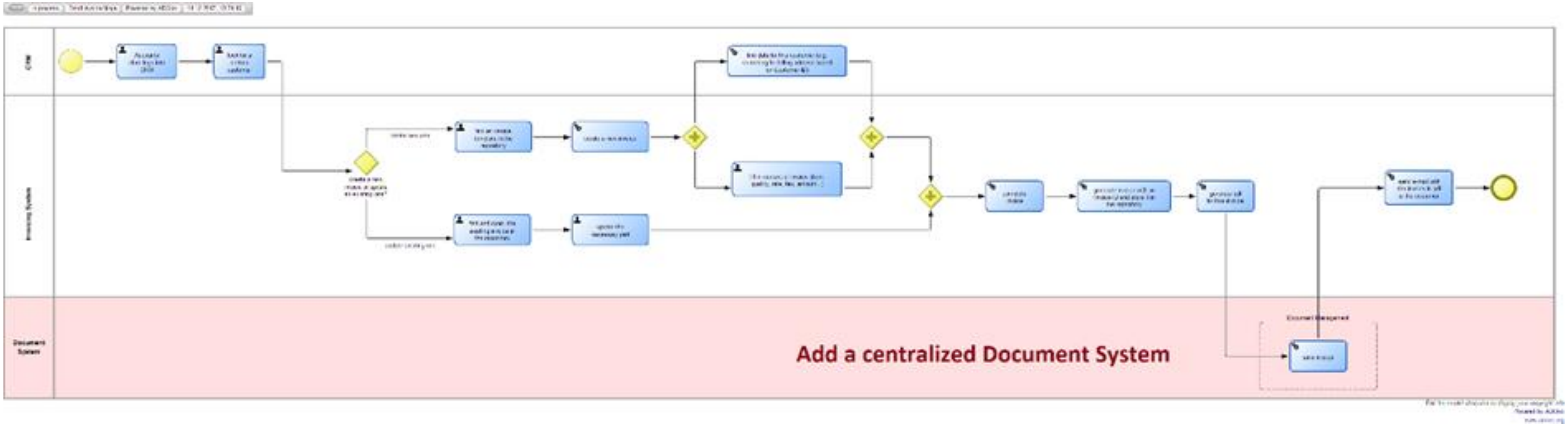


Figure 35: CloudSocket architecture

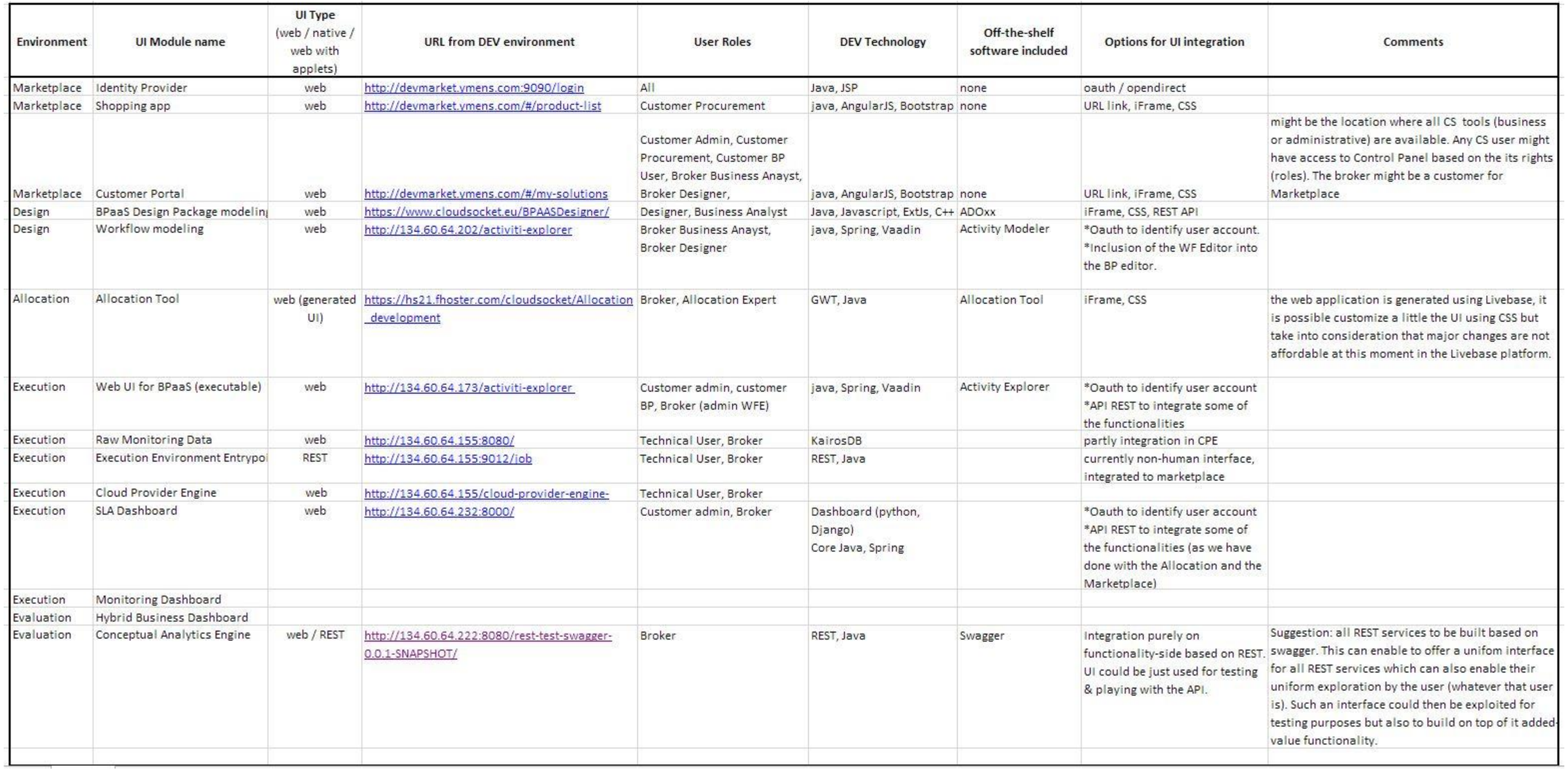
ANNEX B: ABSTRACT WORKFLOW FOR GOLDEN WORM START-UP


In process
BXP-Send invoice
Powered by ADOxx
05.11.2016, 11:52:40
CRM
Invoicing System
Accounts clerk logs into CRM
look for a certain customer
find data for this customer (e.g. searching for billing address based on Customer ID)
create a new invoice or update an existing one?
create new one
find an invoice template in the repository
create a new invoice
fill in content of invoice (item, quantity, rate, tax, amount ...)
update existing one
find and open the existing invoice in the repository
update the necessary part
complete invoice
generate invoice with an invoice ID and store it in the repository
generate pdf for the invoice
send email with the invoice in pdf to the customer
Edit the model attributes to display your copyright info
Powered by ADOxx
www.adoxx.org

ANNEX C: ABSTRACT WORKFLOW FOR GOLDEN WORM TOWARDS ENTERPRISE

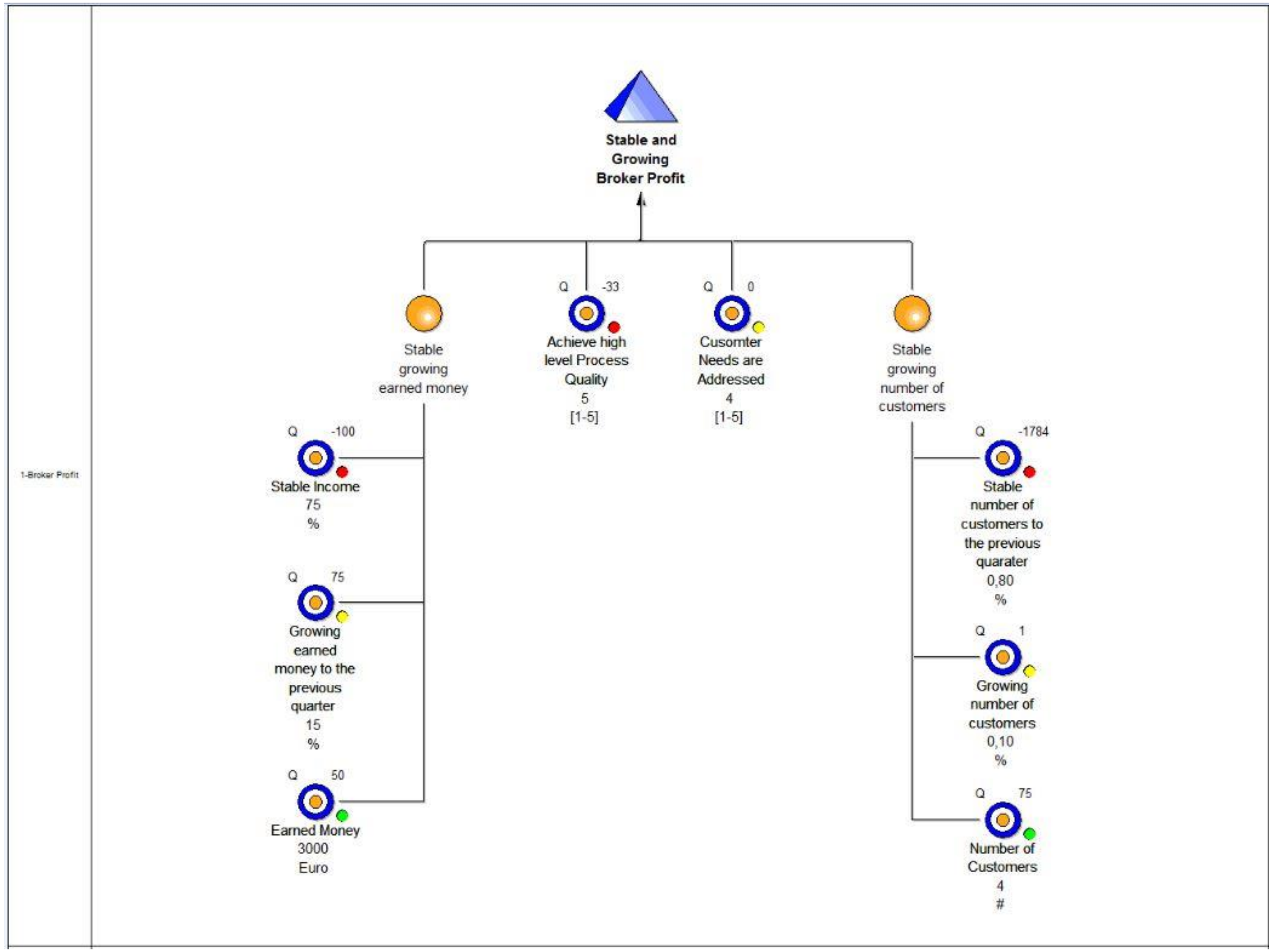


ANNEX D: TOOLS PROVIDED BY ENVIRONMENTS

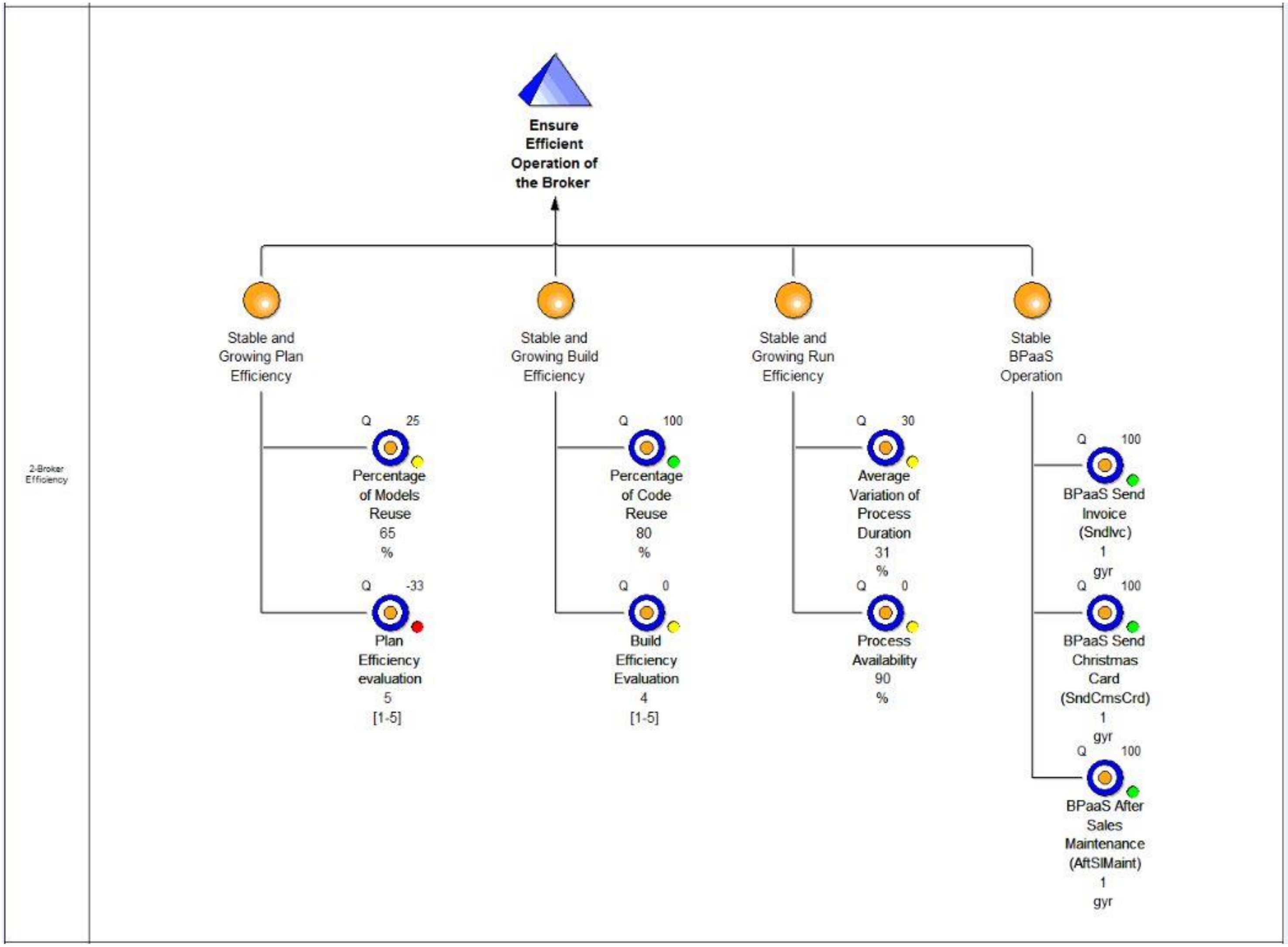


Environment	UI Module name	UI Type (web / native / web with applets)	URL from DEV environment	User Roles	DEV Technology	Off-the-shelf software included	Options for UI integration	Comments
Marketplace	Identity Provider	web	http://devmarket.ymens.com:9090/login	All	Java, JSP	none	oauth / opendirect	
Marketplace	Shopping app	web	http://devmarket.ymens.com/#/product-list	Customer Procurement	java, AngularJS, Bootstrap	none	URL link, iFrame, CSS	
Marketplace	Customer Portal	web	http://devmarket.ymens.com/#/my-solutions	Customer Admin, Customer Procurement, Customer BP User, Broker Business Anayst, Broker Designer,	java, AngularJS, Bootstrap	none	URL link, iFrame, CSS	might be the location where all CS tools (business or administrative) are available. Any CS user might have access to Control Panel based on the its rights (roles). The broker might be a customer for Marketplace
Design	BPaaS Design Package modelin	web	https://www.cloudsocket.eu/BPAASDesigner/	Designer, Business Analyst	Java, Javascript, ExtJs, C++	ADOxx	iFrame, CSS, REST API	
Design	Workflow modeling	web	http://134.60.64.202/activiti-explorer	Broker Business Anayst, Broker Designer	java, Spring, Vaadin	Activity Modeler	*Oauth to identify user account. *Inclusion of the WF Editor into the BP editor.	
Allocation	Allocation Tool	web (generated UI)	https://hs21.fhoster.com/cloudsocket/Allocation_development	Broker, Allocation Expert	GWT, Java	Allocation Tool	iFrame, CSS	the web application is generated using Livebase, it is possible customize a little the UI using CSS but take into consideration that major changes are not affordable at this moment in the Livebase platform.
Execution	Web UI for BPaaS (executable)	web	http://134.60.64.173/activiti-explorer	Customer admin, customer BP, Broker (admin WFE)	java, Spring, Vaadin	Activity Explorer	*Oauth to identify user account *API REST to integrate some of the functionalities	
Execution	Raw Monitoring Data	web	http://134.60.64.155:8080/	Technical User, Broker	KairosDB		partly integration in CPE	
Execution	Execution Environment Entrypoi	REST	http://134.60.64.155:9012/job	Technical User, Broker	REST, Java		currently non-human interface, integrated to marketplace	
Execution	Cloud Provider Engine	web	http://134.60.64.155/cloud-provider-engine-	Technical User, Broker				
Execution	SLA Dashboard	web	http://134.60.64.232:8000/	Customer admin, Broker	Dashboard (python, Django) Core Java, Spring		*Oauth to identify user account *API REST to integrate some of the functionalities (as we have done with the Allocation and the Marketplace)	
Execution	Monitoring Dashboard							
Evaluation	Hybrid Business Dashboard							
Evaluation	Conceptual Analytics Engine	web / REST	http://134.60.64.222:8080/rest-test-swagger-0.0.1-SNAPSHOT/	Broker	REST, Java	Swagger	Integration purely on functionality-side based on REST. UI could be just used for testing & playing with the API.	Suggestion: all REST services to be built based on swagger. This can enable to offer a unifom interface for all REST services which can also enable their uniform exploration by the user (whatever that user is). Such an interface could then be exploited for testing purposes but also to build on top of it added-value functionality.

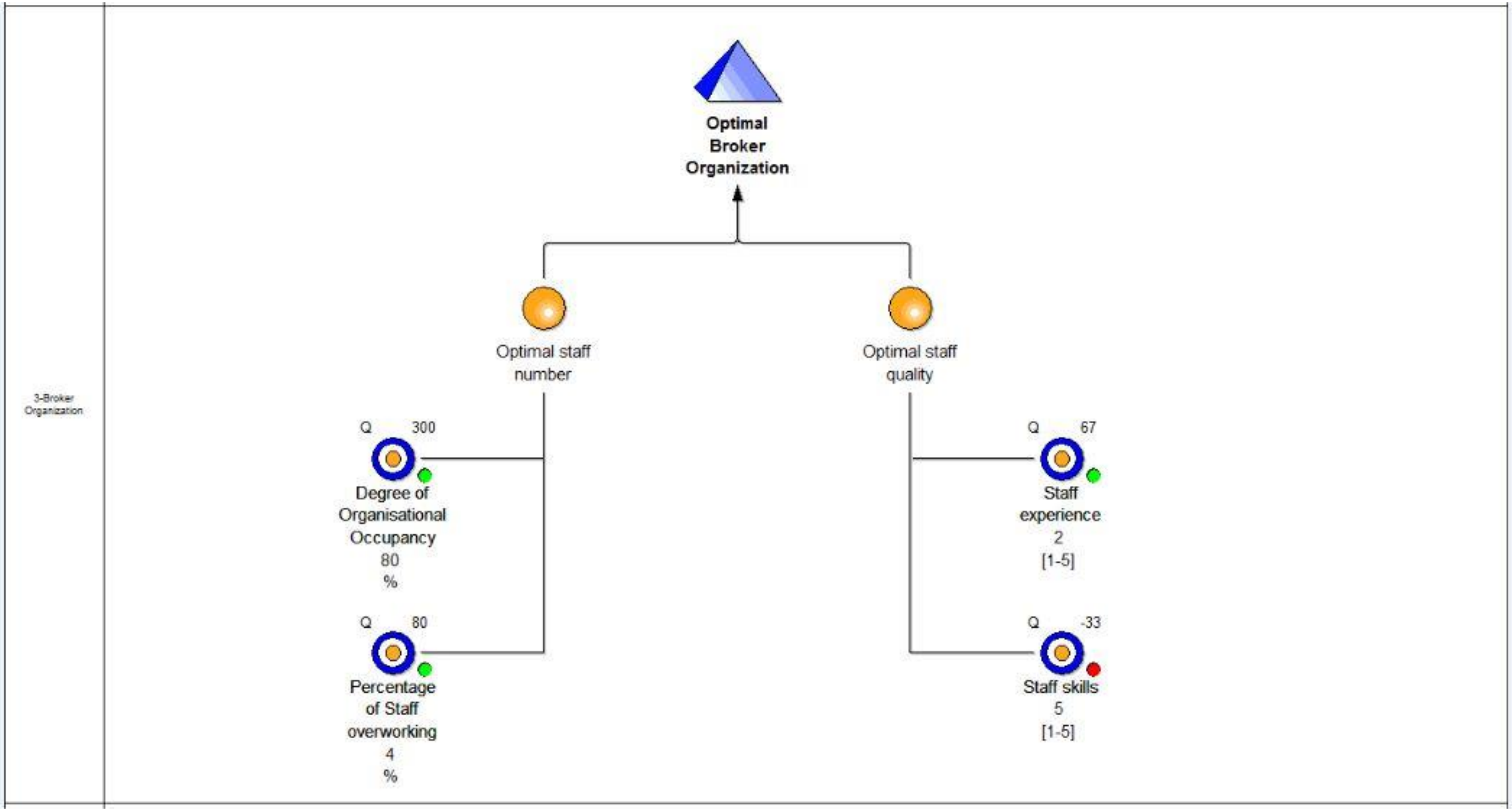
ANNEX E: BUSINESS COCKPIT MODEL: BROKER POINT


1-Broker Profit
Stable and Growing Broker Profit
Stable growing earned money
Q -33
Achieve high level Process Quality
5
[1-5]
Q 0
Cusomter Needs are Addressed
4
[1-5]
Stable growing number of customers
Q -100
Stable Income
75
%
Q 75
Growing earned money to the previous quarter
15
%
Q 50
Earned Money
3000
Euro
Q -1784
Stable number of customers to the previous quarater
0,80
%
Q 1
Growing number of customers
0,10
%
Q 75
Number of Customers
4
#

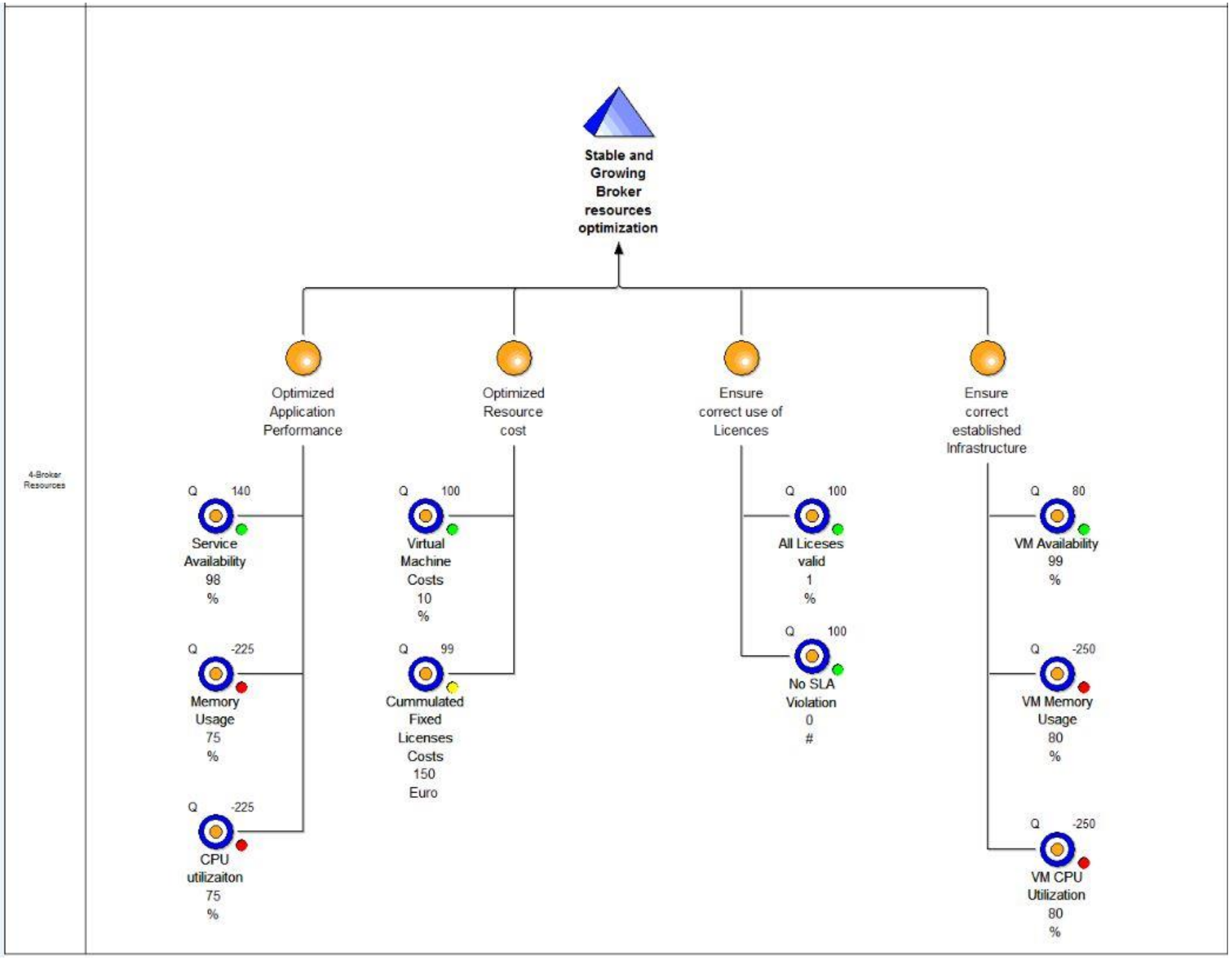
ANNEX F: BUSINESS COCKPIT MODEL: BROKER EFFCIENCY


2-Broker Efficiency
Ensure Efficient Operation of the Broker
Stable and Growing Plan Efficiency
Stable and Growing Build Efficiency
Stable and Growing Run Efficiency
Stable BPaaS Operation
Q 25
Percentage of Models Reuse
65
%
Q -33
Plan Efficiency evaluation
5
[1-5]
Q 100
Percentage of Code Reuse
80
%
Q 0
Build Efficiency Evaluation
4
[1-5]
Q 30
Average Variation of Process Duration
31
%
Q 0
Process Availability
90
%
Q 100
BPaaS Send Invoice (SndIvc)
1
gyr
Q 100
BPaaS Send Christmas Card (SndCmsCrd)
1
gyr
Q 100
BPaaS After Sales Maintenance (AftSlMaint)
1
gyr

ANNEX G: BUSINESS COCKPIT MODEL: BROKER ORGANIZATION



ANNEX H: BUSINESS COCKPIT MODEL: BROKER RESOURCES


4-Broker Resources
Stable and Growing Broker resources optimization
Optimized Application Performance
Optimized Resource cost
Ensure correct use of Licences
Ensure correct established Infrastructure
Q 140
Service Availability 98 %
Q -225
Memory Usage 75 %
Q -225
CPU utilizaiton 75 %
Q 100
Virtual Machine Costs 10 %
Q 99
Cummulated Fixed Licenses Costs 150 Euro
Q 100
All Liceses valid 1 %
Q 100
No SLA Violation 0 #
Q 80
VM Availability 99 %
Q -250
VM Memory Usage 80 %
Q -250
VM CPU Utilization 80 %