

Asseco LIVE – product description

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1 Introduction

Summary

This document describes LIVE functionalities for modern interaction of any organization (bank, insurance, etc.) with the customers over Internet communication channels, providing full customer experience that is equal or better than the customer experience in a branch office.

Audience

Business and IT Managers, business analysts and other stakeholders in the process of direct communication with customers or potential customers.

Conventions

Typographical conventions



Important information is placed in a note, indicated by the pencil in the margin.



If important security related issue is explained, this is indicated by padlock in the margin.



If special attention is required when changing setup, this is indicated by a caution triangle in the margin.



If there is a potential danger of solution malfunctioning resulting from incorrect setup, this is indicated by a stop sign in the margin.

Application menu items and tabs are indicated by bold text e.g. **Menu Item**.

Application buttons are indicated with bold and underline text e.g. **Button**.

The exact text you have to type and screen text output are indicated by courier font e.g. `install`.

The text you have to replace with appropriate value is indicated by italic font e.g. *installation path*.

Keyboard keys that you have to press are represented with small caps font e.g. ENTER or CTRL-C.

List of Acronyms

The following acronyms are used in this document:

Acronym	Meaning
LIVE	Asseco omni-channel customer experience platform
CAWI	Computer Assisted Web Interviewing
WebRTC	Web Real Time Communications

Related Information

Related information about LIVE solution could be found on <https://live.asseco.com/> or could be obtained from Asseco sales representative.

2 Live Product description

Business benefits

Improved customer satisfaction

Improved customer satisfaction – reduced churn, because:

- The clients can contact the organization over different communication channels for different purposes (requesting information, service, product, for complaint, etc)
- The clients can contact the organization 24/7 without going to the location, to leave a voice message or to ask for call back
- Agents have a Knowledge Base to use it for answering client requests
- Possibility to make appointments via the Contact Center, with attached documentation
- The client can learn the status of its request via the Contact Center (because of the ticketing mechanism)
- Possibility for the clients to answer a questionnaire while waiting on IVR machine about satisfaction from products and services
- Personalized service – better service for the clients because Contact Center agents will have address and product data per client (retrieved from CORE), history of communication with that client
- Possibility for a special treatment of VIP clients (waiting queue priority, different conversation, different debt collection process, etc)
- Distribution of service requests to agents with adequate skills
- Agents will have a view on abandoned calls and call-back requests, so clients can be contacted later
- Agents can use a “Scripter” that the organization can create depending on the type of the call so that agents click on questions and depending on client’s answer go forward
- The supervisor can monitor and listen to the calls with the agents, can chat and whisper answers to the agents, in order the agent to provide better answer to the client
- Better image of the organization with a high quality Contact Center

Optimized and streamlined processes

Optimized and streamlined processes - because:

- Contacts with clients will be done by trained agents, while back-office workers will do their regular core business not wasting time on direct contact with customers
- The client can retrieve or enter information by pressing telephone buttons, with no need to engage an agent (self-service on IVR)
- Telephone banking module for Banks
- Agents can use “click-to-dial” and other computer-integrated functionalities without a need for dialing numbers, opening email application for sending emails, etc
- Possibility for defining workflows via lifetime of the ticket (defining the work process, states, responsible for solving the ticket in a given state, time for solving the ticket and escalation time, tasks, delegating tickets, etc)
- Possibility to measure efficiency (KPI) per communication channel, organizational unit, employee (possibility to discover bottlenecks in the processes, performers and non-performers)
- No need for so many emails between employees. In practice many emails are unanswered while this application provides notifications and escalations for unresolved tickets.
- Decreased number of excel sheets circulating in the organization – the application provides central place for reports, campaigns, address books, tickets, targets.
- Availability of reports, audio recordings, logs and audit trail needed for internal and external audit and compliance

- Acceleration of business processes because employees will work in one application instead of opening few applications when resolving a ticket, due to availability of attachments and external data retrieved from other enterprise systems

Improved sales and revenue per customer

Improved sales and revenue per customer (campaigns and sales modules):

- Possibility for sales during incoming calls – an offer can be recorded on IVR, a meeting can be arranged with the client, the agent can offer a product that the client doesn't have because the agent sees product list for that client
- Improved remuneration and appraisal for the sales force, because there will be an overview of all sales tickets and their success per employee
- Possibility for executing mass campaigns over telephone, email, SMS letter, by importing a target list of clients
- Possibility to use an automated Dialer for mass telephone campaigns
- Possibility to measure success of a campaign, so that correction can be made in the future
- Possibility to integrate with other sales channels (e.g. mobile application can send request and the Contact Center can create an automatic sale ticket)

Centralized contact data management

Centralized contact data management:

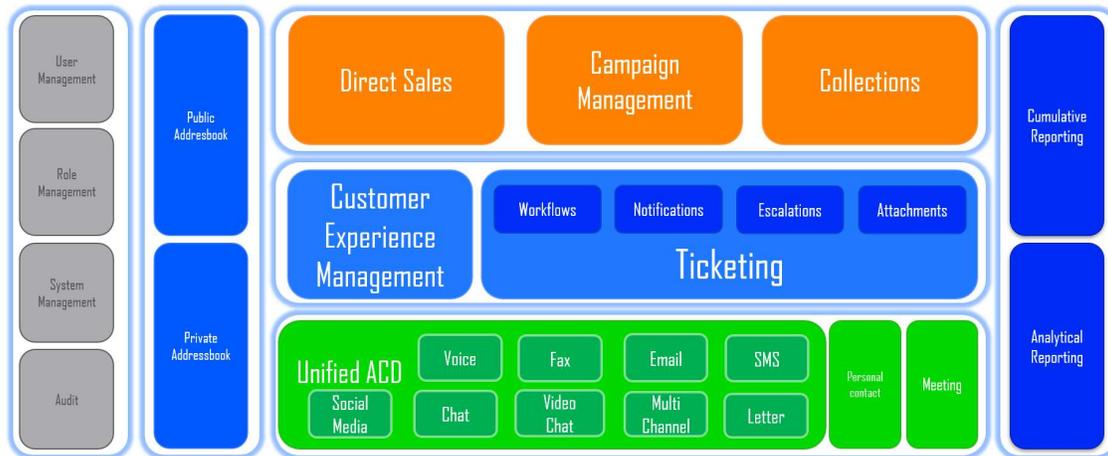
- Central repository of clients' contacts address data
- Early identification of client based on available address data
- Based on established communication agent can easily update or expand contact address data (based on given privileges)

Statistics and reporting

Statistics and reporting:

- Solution provides communicative and analytical reporting
- Provides reports about:
 - the contact center
 - contact management (what type of tickets are opened, successfully solved, who solved them, solving time...)
 - campaigns
 - sales
 - collections
- Cumulative contact center reporting based on EN 15838
- Analytical reporting based on drop-down filters where that user chooses relevant parameters to create own analytical reports
- Support for dashboard and wallboard provides on-line view of critical operational KPIs

Solution concept



As shown on picture above solution supports six logical units:

- **Communication**
- **Contact management**
- **Business processes automation**
- **Administration**
- **Address book**
- **Reporting**

Communication part provides **multi-channel support**. Component implements variety of communication channel, technologically dependent as voice, fax, e-mail, SMS, social media, chat, video chat and multi-channel and independent as letter, personal contact and meeting. Functionality of automatic communication distribution (ACD) and skill based routing (SBR) provides routing of communication to most suitable skill group or agent.

Contact management implements ticketing mechanism for business processing of single contact. According to classification of contact different workflow is provided and could be delegated to different group or user for processing. After delegation of task each responsible person or group receives notification mail and time for processing task starts. When processing time limit is reached solution will automatically send escalation mail as warning to its superior. During ticket processing users could store attachments and use knowledge base for help. Solution enables monitoring of contact processing to users with adequate permissions. Also solution calculates SLA timers providing powerful engine for improvement quality of service. **Contact management** part of solution provides **Omni-channel** approach to communication part.

Business processes automation implements on top of **contact management** part logic for different specific business processes such as:

- **Direct sales** – sales campaign planning, product information, consulting, up-selling, cross selling, target oriented customer advices
- **Campaign management** - campaign planning and execution over all supported communication channels

Administration represents centralized administration for complete solution. **User management** provides user definition and permission management per single user or group. **Role management** implements different roles for different kind of users. **System management** enables system

configuration for each communication channel, contact processing and each business process. Every activity on solution is recorded for adequate **audit log**.

Address book provides repository of **contacts data** also supports different kinds of public address books with different privileges, user could access to address book only with valid permissions. Each user could define its own private address book.

Reporting represents powerful engine for generating statistical and analytical reports. **Cumulative reports** enable tracking of all activities in the history. **Analytical reports** based on easy to use filter engine give detailed insight into particular contacts.

Communication channels

Features of communication channels are divided per communication media types:

- Phone
- SMS
- E-mail
- IM(Chat)
- Video/Audio Chat
- Web form
- Letter
- Facebook Messenger module
- Direct messaging module
- Messaging module

Unified ACD

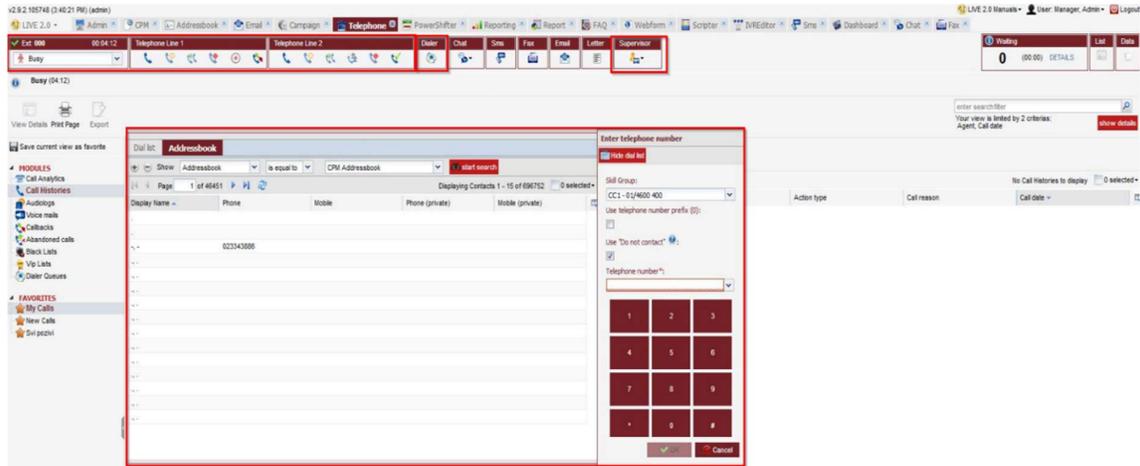
Unified Automatic Communication Distribution ensures efficient customer's contact routing to most appropriate available agent. It controls distribution of communication with different priority levels (based on caller identity or service importance) towards different skill groups with agents having different competence levels and prior engagement.

All inbound communications that are supposed to be connected to agents enter the queue from which are distributed based on priority (both service and client) and time spent in queue. Agent selection is done based on its authorization and pre-defined distribution criteria (configurable: cyclic, most free, and least occupied). The additional criteria is agent's competence and skill-level which is used to set up maximum acceptable distribution queue load (time spent in queue and maximum number of communication waiting) when distribution group is expanded to another set of agents.

Typical implementation is differentiating clients based on their identity, separating waiting queues, ensuring fair distribution and call routing to preferred agent, and collecting distribution data for measuring performance.

Call Center

Voice media communication is communication over the phone. Module responsible for processing voice communication over the phone is also known as Call Center module.



IVR

Interactive Voice Response provides possibility of presenting voice and fax information based on interaction of caller and system. Voice information interpretation is based on VoiceXML (supports version 2.1) and CCXML (supports version 1.0). The interaction is done using touch tone phone keypad (DTMF) after call establishment. Voice information can be pre-recorded or it can be generated on-the-fly based on numeric data (numbers, date & time, etc.).

Typical implementation is automatic customer informing on some static and dynamic data (e.g. account balance, transaction status or currency exchange lists).

CTI Interface

Computer telephony integration is a common name for any technology that allows interactions on a telephone and a computer helping users to be more efficient.

Provided functionalities:

- Presence - log in/out and agent state control
- Screen popping - Call information display, data transfer and data forwarding
- Basic call control - answer call, hang up call, dialing
- Advanced call control – on/off hold, transfer to service, IVR and skill group , forward, conference (listening, coach/pupil and full conference)
- Queue information
- Search internal directory
- Caller history
- Supervising the call (supervisors only) - on-line monitoring of agents and lines, call routing and conferencing technologies using modules Line Monitor and Agent Monitor enables call center supervisors to control and enter call during conversation.

Agent Desktop application is central component of agent environment. This Java applet enables agent to establish real-time communication with call center environment.

Audio recording

Audio recording provides functionality of recording conversation between customer and call center agent. The recording is done on the trunk side (rather than on agent side) which is in VoIP technology at network level. Voice recordings are initially stored to HDD and backup is transferred to network storage.

Client application “Audiologging” is used by call center supervisors for listening, searching (call detail access), browsing, managing and administering call recordings database.
This functionality is used for audio recording all legal voice transactions or for training purpose.

Voice Mail

Voice Mail provides voice mail functionality through possibility of recording and distributing voice messages. Distribution of voice mails is integrated with e-mail.
Client Voice Mail application is used for listening, searching, browsing, managing and administering voice messages database.
This component is used in a case of busy agents or after work time.

Automatic Dialer

Automatic dialer is functionality of calling campaigns thus enabling automatic customer calling in purpose of informing, promotional campaigns, selling, or debt collection. Calling process dynamic and call distribution towards particular groups of agents are configurable.

Functionality supports: preview dialing mode (call is generated after agents call action enabling agent to prepare for particular call), power dialing mode (automatically generates call for all available agents for particular campaign and distributes successful calls to appropriate agents) and predictive dialing mode (system anticipate free agent and calls customer before agent is available).
“ProDialer” is application used for configuring dialing algorithm and dialing rules, configuring calling campaigns, managing and monitoring calling queues as well as access to status of executed calls.

Call scripting

Call scripting is used as supplement to calling campaigns, the same time agent can work on several campaigns simultaneously. It enables automatic generating conversation scripts thus supporting call flow during conversation. Scripts can contain static text, questions and seta of replies, links, customer data, as well as data provided from IT environment. The results collected during conversation as well as call data are stored and later can be analyzed or transferred to IT environment.
“Scripter” is application used for creating, editing and configuring conversational scripts.
SMS media communication is communication with short messages over the mobile phone devices. Module responsible for processing SMS communication is SMS Server module.

Script Marketing survey - MobileBanking

Hello, we call you from BANK_NAME, can we speak with MATTHEW COVER?

Answer options:

I'm MATTHEW COVER
 He/She isn't here
 Wrong number

Asseco

Previous Next Finished

SMS Server

SMS Server is reliable and robust solution that enables deployment of comprehensive SMS services to fit different needs and requirements. It is designed to support different scenarios where low-end high volume SMS messaging is required and can be deployed anywhere in the world in collaboration with local telecom operators and GSM modems.

SMS Server implements following functionalities:

- Basic functionalities – sending and receiving SMS messages
- Bulk SMS – mass SMS sending to mobile users in defined periods of time
- Push/Pull SMS - on-line exchange of SMS messages

“SMS” application is used for accessing received SMS messages, sending SMS messages, SMS correspondence, searching, browsing, managing SMS database. Supported SMS protocols are SMPP and ParlayX.

The screenshot displays the SMS Server web interface. The main area shows a table of messages with columns for Status, Skill group, Sender, and Recipient. A detailed view of a selected message is shown on the right, including fields for SENDER, TO, and a message body starting with 'Dear NAME 1 Lorem ipsum...'. The interface includes a navigation menu on the left and various action buttons at the top.

Flags	Status	Skill group	Sender	Recipient	Sent/Received
	Sending	Sms grupa	62424	190	
	Not Sent	Sms grupa	62424	191	
	Not Sent	Sms grupa	62424	192	
	Not Sent	Sms grupa	62424	193	
	Not Sent	Sms grupa	62424	194	
	Not Sent	Sms grupa	62424	195	
	Not Sent	Sms grupa	62424	113	
	Not Sent	Sms grupa	62424	107	
	Not Sent	Sms grupa	62424	108	
	Not Sent	Sms grupa	62424	109	
	Not Sent	Sms grupa	62424	110	
	Not Sent	Sms grupa	62424	111	
	Not Sent	Sms grupa	62424	112	
	Not Sent	Sms grupa	62424	106	

E-mail Server

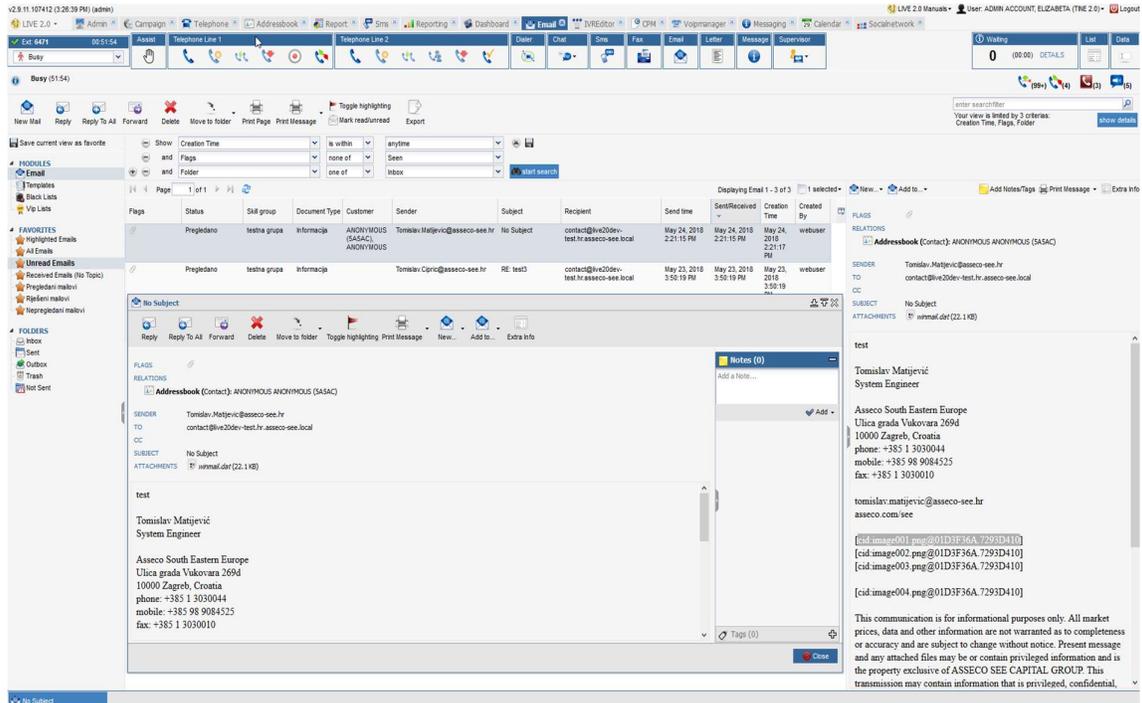
E-mail media communication is communication with e-mail messages over the network. Module responsible for processing e-mail communication is E-mail Server module.

E-mail Server is reliable and robust solution that enables deployment of E-mail services to fit different needs and requirements. It is designed to support different scenarios where low-end high volume e-mail messages are required.

E-mail Server implements following functionalities:

- Basic functionalities – sending and receiving e-mail messages
- E-mail broadcast - mass sending of e-mail messages to clients in defined periods of time
- Digitally signed e-mails - every e-mail messages can be signed by customer certificate. System can digitally signed only e-mail body or/and attachment of e-mail

“E-mail” application is used for accessing received e-mail messages, sending e-mail messages, e-mail correspondence, searching, browsing and managing e-mail database.



Letter module

Letter module is reliable and robust solution that enables the functionality of efficient letter exchange with the clients, providing following features:

- Template generator
- Document generator from template (mail merge)
- Document storage

Letter application is used for accessing documents, generation of documents, document correspondence, searching, browsing and managing documents.

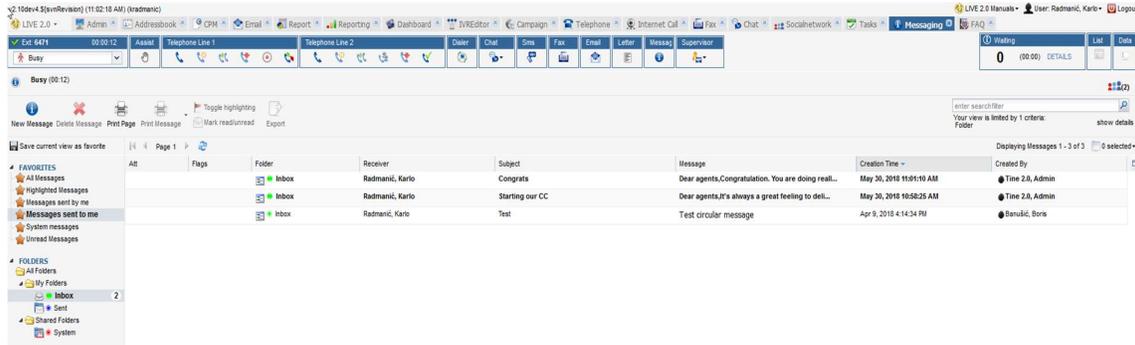
Letter module can be used in process of sending warning letters to participants in debt.

Examples of letters used in Collections process are:

- Warning (1st, 2nd, 3rd).
- Salary pledge activation.
- Salary pledge increase.
- Debenture activation.
- Debenture deactivation.

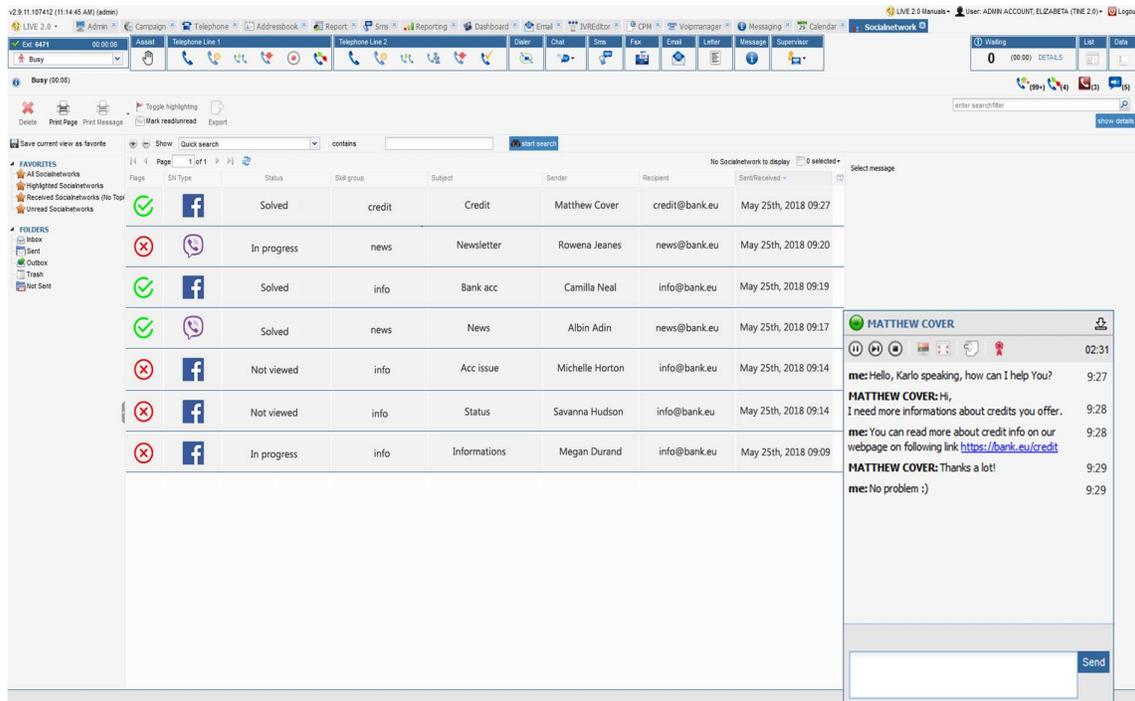
Messaging module

Messaging module is used for internal communication between System users. It is simple way to have internal communication done without leaving LIVE 2.0. This module makes agent efficient and faster in job.



Facebook Messenger module

Socialnetwork Module is module integrated with social networks. This module connects LIVE with Facebook and his messenger option. It is used to improve company relationship with clients through social network platform and his communication options. Through LIVE agent can track every correspondence related to specific page (for example Bank page) and provide fast answer to the client problem.



Contact processing - CPM

Contact processing module implements customer care mechanism for single contact (client or potential client). Based on ticketing mechanism processing provide classification of client request on customer defined types providing different workflows and fits to customer organizational units. Entry point for contact processing is communication established over supported communication channels as single point of all contacts in communication with clients or potential clients.

Contact processing module providing following features:

- Ticket creation
- Classification of contact, based on:
 - Subject of contact
 - Dedicated organizational unit
- Definition of contact priority based on:
 - Client importance
 - Subject of ticket
- Execution of defined workflow per ticket
- Delegation of ticket to dedicated organizational unit
- Follow ups
- Notification mechanism for users and group when ticket is delegated for processing
- Escalation mechanism for ticket which are not closed in defined time frame
- Multiple ticket on single contact communication
- Per single ticket user can store different attachments in digital form
- User permissions per classified ticket
- Definitions of custom fields per ticket type
- History of:
 - Single ticket
 - All contact correspondence with customer
- Knowledge base on frequently asked questions engine
- Definition of tasks (reminders) per single ticket
- View of contact business relationship with customer based on data stored in address book

“CPM” application provides functionality of ticket creation based on correspondence on different communication channel, ticket classification and processing, view of delegated tickets and ticket search per different parameters.

ID	Name	Customer	Topic Type	State	Responsible	Creation Time	Last Modified Time
111	Goran Topicaneac	Topicaneac, Goran	Complaint	In process	Agent, Agent	May 16, 2018 2:23:00 PM	May 22, 2018 10:25:47 PM
116	Test 123	Galinec, Domnik	Complaint	In process	Baruđić, Ivan	May 16, 2018 9:47:59 AM	May 22, 2018 10:25:23 AM
112	Domnik Galinec	Galinec, Domnik	Info	Assigned	Baruđić, Boris	May 21, 2018 11:56:47 AM	May 21, 2018 11:56:47 AM
107	Anonymous Anonymous (422c)	Anonymous (422c), Anonymous	Marip_Test	Assigned	Group_1	Mar 21, 2018 12:08:51 PM	May 21, 2018 11:17:17 PM
105	Marip Pavlov	Pavlov, Marip	Marip_Test	Assigned	Pavlov, Marip	Mar 21, 2018 12:00:49 PM	Apr 15, 2018 12:00:52 AM
106	Anonymous Anonymous (448f)	Anonymous (448f), Anonymous	Marip_Test	Assigned	Pavlov, Marip	Mar 21, 2018 12:07:27 PM	Apr 15, 2018 12:00:52 AM
109	Anonymous Anonymous	Anonymous, Anonymous	Marip_Test	Assigned	Tim 2.0, Admin	Apr 8, 2018 11:48:51 AM	Apr 8, 2018 11:48:51 AM
108	Marip Pavlov	Pavlov, Marip	Marip_Test	Assigned	Pavlov, Marip	Mar 21, 2018 3:21:36 PM	Mar 22, 2018 11:20:02 PM
104	Marip Pavlov	Pavlov, Marip	Lead Management	Assigned	Baruđić, Boris	Mar 21, 2018 11:46:18 AM	Mar 21, 2018 11:46:18 AM
103	Anonymous Anonymous (aa60)	Anonymous (aa60), Anonymous	Lead Management	In progress	CC agents	Mar 14, 2018 10:14:04 AM	Mar 14, 2018 10:21:16 AM
99	Anonymous Anonymous (d61d)	Anonymous (d61d), Anonymous	Lead Management	Resolved	CC agents	Mar 14, 2018 9:22:43 AM	Mar 14, 2018 10:12:06 AM
102	Anonymous Anonymous (b95e)	Anonymous (b95e), Anonymous	Lead Management	In progress	CC agents	Mar 14, 2018 10:11:38 AM	Mar 14, 2018 10:11:38 AM
101	Anonymous Anonymous (4623e)	Anonymous (4623e), Anonymous	Lead Management	In progress	Tim 2.0, Admin	Mar 14, 2018 9:48:03 AM	Mar 14, 2018 9:48:03 AM
100	Anonymous Anonymous (8e0c)	Anonymous (8e0c), Anonymous	Lead Management	In progress	CC agents	Mar 14, 2018 9:25:04 AM	Mar 14, 2018 9:25:04 AM
98	Anonymous Anonymous (85fa)	Anonymous (85fa), Anonymous	Lead Management	In progress	CC agents	Mar 14, 2018 9:20:22 AM	Mar 14, 2018 9:20:22 AM
97	Karlo Radmanić	Radmanić, Karlo	Lead Management	In progress	CC agents	Mar 13, 2018 12:23:35 PM	Mar 13, 2018 12:23:35 PM
96	MATTHEW COVER	COVER, MATTHEW	Info	Assigned	Baruđić, Boris	Mar 5, 2018 7:16:06 PM	Mar 12, 2018 12:00:16 AM
92	Anonymous Anonymous	Anonymous, Anonymous	Incident	Assigned	Tim 2.0, Admin	Feb 8, 2018 9:50:26 AM	Feb 8, 2018 10:00:36 AM
95	MATTHEW COVER	COVER, MATTHEW	Helpdesk	Assigned	Back office	Feb 23, 2018 3:00:35 PM	Feb 26, 2018 10:54:05 PM
94	Domnik Galinec	Galinec, Domnik	Collection	Assigned	Radmanić, Karlo	Feb 21, 2018 2:32:57 PM	Feb 21, 2018 2:32:57 PM
93	Matthew Cover	Cover, Matthew	Helpdesk	Assigned	End_users	Feb 11, 2018 4:27:36 PM	Feb 13, 2018 7:20:06 AM
91	Anonymous Anonymous (d3fa)	Anonymous (d3fa), Anonymous	Complaint	Assigned	Back office	Dec 11, 2017 1:00:35 PM	Dec 11, 2017 1:00:35 PM
90	Anonymous Anonymous	Anonymous, Anonymous	Complaint	In process	Akar, Mutlu	Nov 30, 2017 8:34:42 AM	Nov 30, 2017 8:34:42 AM

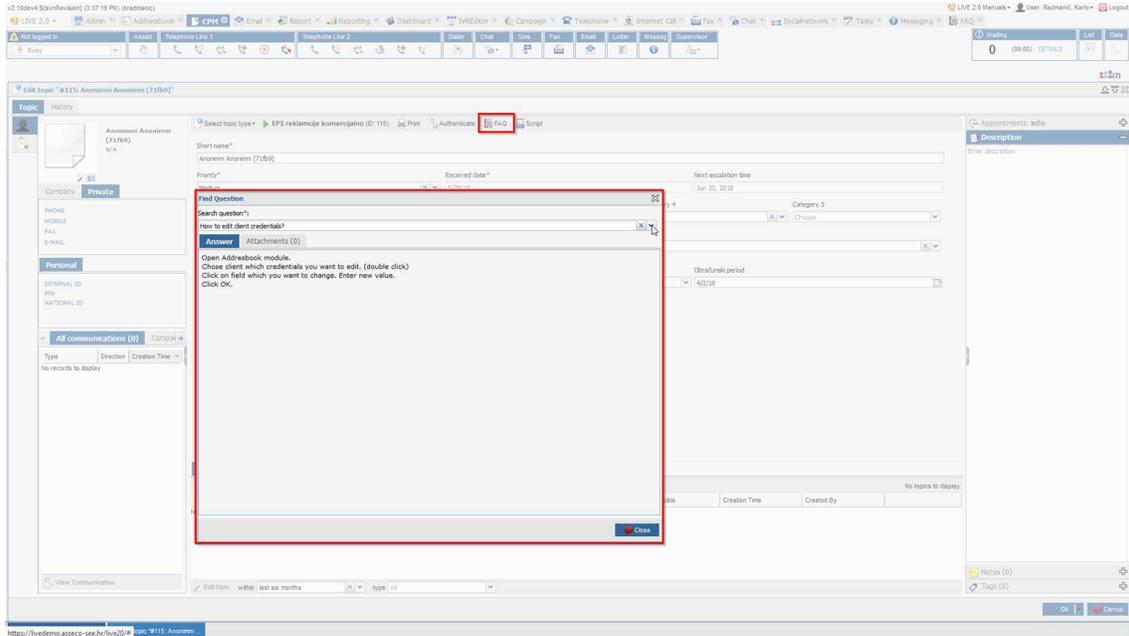
FAQ module

FAQ module is designed for easy management and use of knowledge base in the form of Frequently Asked Questions.

Questions with answers can be placed on a general level, so that every user who has access to the module sees all the information there. However, each user can complement his database for himself, if he have rights.

All users will see those questions with answers that add an administrator. The questions that the user will enter could see only him.

There is always possible to see FAQ icon on every communication type, and use it for more effective and faster problem solving.



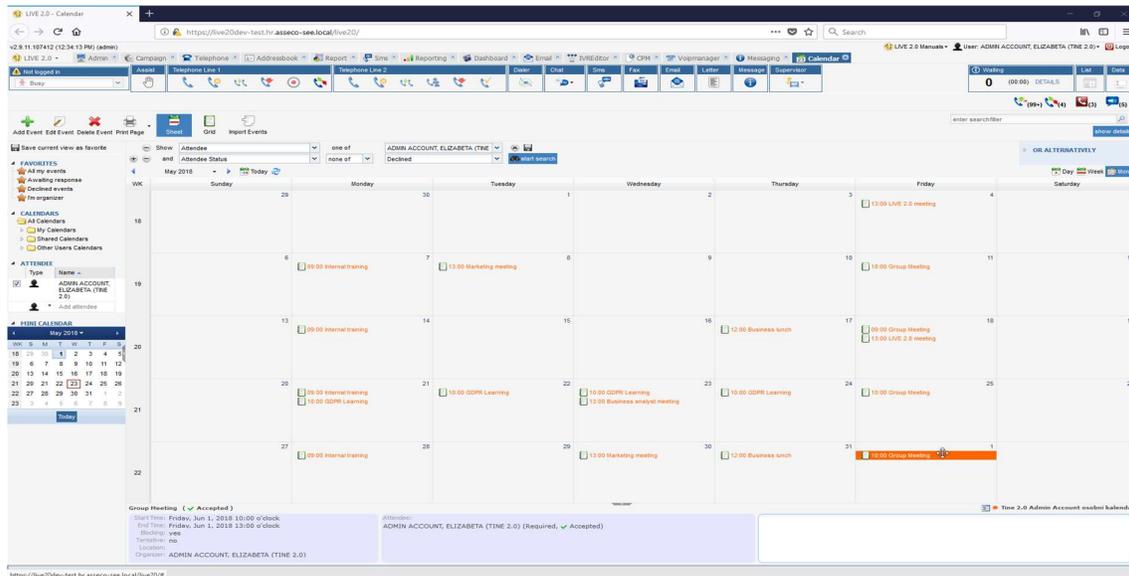
Calendar

Calendar module is reliable and robust solution that enables personal organization of meetings.

Module provides following features:

- Basic functionality – arrangement of meeting and reminders
- Supervisor functionality – supervisor have read and write permissions on subordinate calendar

“Calendar” application is used for creation of meetings, searching, browsing and managing calendar entries.



Campaign management

“Campaign” module implements business process of execution of campaigns. Purpose of communication campaigns is to get information from clients or potential clients or to provide some information to clients or potential clients.

Process starts with creation of the campaigns. Definition of the campaign depends of communication channel which is used for execution. Clients or potential clients which participate into campaign are imported into campaign from two main sources:

- From address book – by defining some search criteria (geo location parameters and/or custom fields)
- Import from CSV file

Communication is automated.

Campaign management module providing following features:

- Definition of campaigns
- Import of clients and/or potential clients
- Client contacting over supported communication channels
- Providing or getting information from campaign participants
- Reporting
 - Right party contact rate
 - Bad numbers
 - Cumulated campaign data

The screenshot shows a software interface with a table of campaign reports. The table has columns for ID, Action, Priority, Type, Progress, Status, Start Time, Finish Time, Creation Time, and Created By. The data rows show various campaign actions like 'Algorithm test', 'training', and 'Sms' with their respective progress and completion status.

ID	Action	Priority	Type	Progress	Status	Start Time	Finish Time	Creation Time	Created By
155	Algorithm test	Normal	filter	1/1 (100%)	finished	May 17, 2018 12:05:59 PM	May 17, 2018 12:06:03 PM	May 17, 2018 12:05:48 PM	ADMIN ACCOUNT, ELIZABETA (TNE 2.0)
154	Algorithm test	Normal	filter	1/1 (100%)	finished	May 17, 2018 11:14:33 AM	May 17, 2018 11:14:33 AM	May 17, 2018 11:14:24 AM	ADMIN ACCOUNT, ELIZABETA (TNE 2.0)
153	Algorithm test	Normal	filter	1/1 (100%)	finished	May 17, 2018 11:09:57 AM	May 17, 2018 11:09:57 AM	May 17, 2018 11:09:16 AM	ADMIN ACCOUNT, ELIZABETA (TNE 2.0)
152	Algorithm test	Normal	filter	1/1 (100%)	finished	May 17, 2018 10:56:36 AM	May 17, 2018 10:56:36 AM	May 17, 2018 10:56:24 AM	ADMIN ACCOUNT, ELIZABETA (TNE 2.0)
151	training1	Normal	file	3/2 (100%)	finished	May 10, 2018 10:09:49 AM	May 10, 2018 10:10:00 AM	May 10, 2018 10:09:40 AM	ADMIN ACCOUNT, ELIZABETA (TNE 2.0)
150	training1	Normal	file	3/2 (100%)	finished	May 10, 2018 10:07:10 AM	May 10, 2018 10:07:11 AM	May 10, 2018 10:06:59 AM	ADMIN ACCOUNT, ELIZABETA (TNE 2.0)
149	Sms CPN - Ne	Normal	filter	3/2 (100%)	finished	May 9, 2018 3:38:02 PM	May 9, 2018 3:39:47 PM	May 9, 2018 3:37:52 PM	BANUŠIĆ, BORIS
148	Sms CPN - Da	Normal	filter	3/2 (100%)	finished	May 9, 2018 3:35:04 PM	May 9, 2018 3:35:06 PM	May 9, 2018 3:34:41 PM	BANUŠIĆ, BORIS

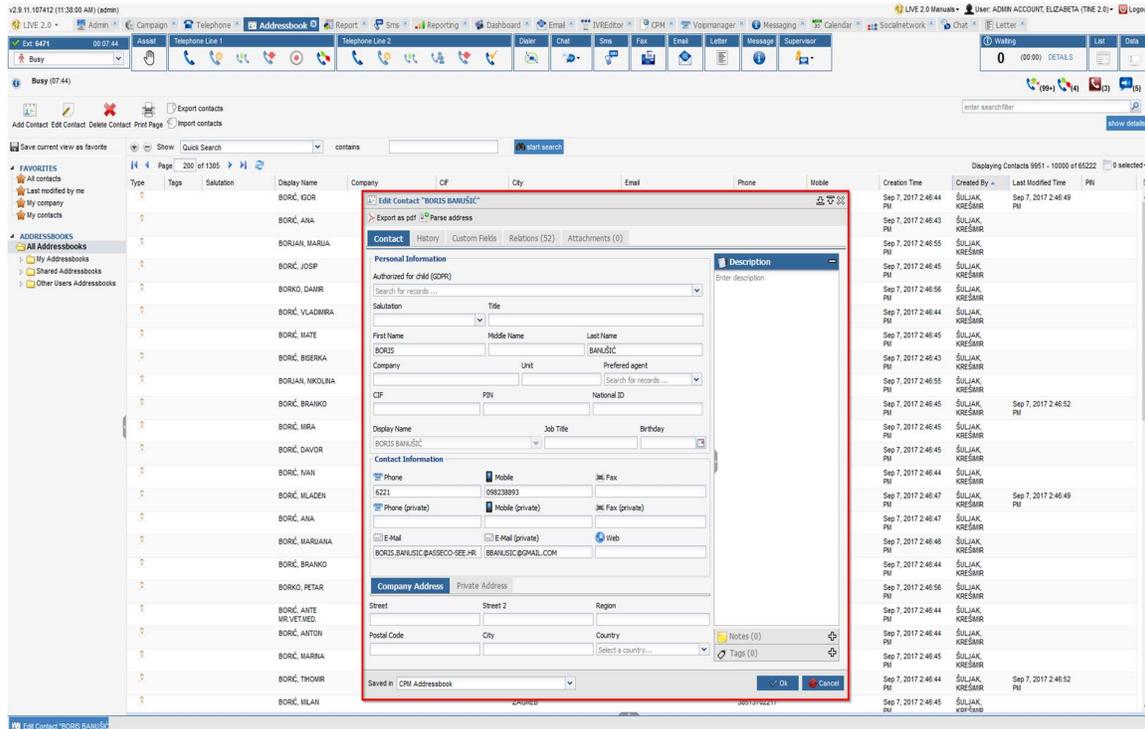
Address books

Address book represents central repository of all contacts (clients and potential clients). Regarding to customer needs system provides functionality of multiple public address books adjusted to organizational structure of the customer. Also each user could use address book as its own storage of contacts as private address book. According to given privileges each user could see only contact dedicated to single user.

Address book module providing following features:

- Import and export of contacts
- Multiple public and private address books
- User permissions administration
- Relationship between contacts
- Definitions of custom fields
- Geo location of contact

Module stores internally contact in vCard standard.



Administration

Administration represents centralized module for administration of all users, modules and functionalities.

User management provides user definition and permission management per single user or group of users. Role management implements different roles for different kind of users. System management enables system configuration for each communication channel, contact processing and each business process.

Every activity on solution is recorded for adequate audit log providing robust solution for change tracking.

Reporting

Reporting module represents powerful engine for generating statistical and analytical reports.

During every day activities all information are stored in system database providing powerful base for all kind of reports.

Solution provides two kinds of reporting:

- Cumulative reporting
- Analytical reporting

Cumulative reports enable reports of events in defined time period. Analytical reports based on easy to use drill-down filter engine provide detailed insight into any kind of information.

Cumulative reporting features:

- Reporting per communication channel

- Reporting per agent
- Reporting per organizational unit
- Key performance indicators
- Workforce management
- export to XLS format

Analytical reporting features:

- Drill down filters
- Storing custom definitions of filters as templates
- export to XLS format

The screenshot shows the ASEBA LIVE 2.0 Reporting interface. The main content is a table titled 'Subject Perspective / Agents / 2018'. The table has columns for Agents, Total Busy, Available, Away, Pause, Work time, Total Talk Time, Total OB Calls, Total Calls, and Total B calls. The data is summarized for 9 agents and an overall Total.

Agents	Total Busy	Available	Away	Pause	Work time	Total Talk Time	Total OB Calls	Total Calls	Total B calls
1. Agent	74:01:57	192:31:35	00:15:28	58:35:49	339:58:57	6887:26	464	1279	615
2. Agent	1:02:29:41	58:00:21	00:00:07	96:55:38	231:38:27	14:05:11	111	367	256
3. Agent	73:24:48	208:49:45	00:17:14	40:09:37	340:37:26	55:08:32	303	1103	800
4. Agent	37:42:45	226:16:34	01:02:02	25:48:23	324:48:13	53:31:59	566	1455	889
5. Agent	49:57:07	274:37:08	00:25:00	28:52:18	397:59:02	65:00:21	828	1642	784
6. Agent	96:34:03	110:23:48	01:49:41	52:12:14	239:32:01	30:26:50	3	309	308
7. Agent	1:05:37:17	372:16:23	00:00:18	75:03:09	520:21:32	40:28:59	183	1071	808
8. Agent	02:09:39	194:42:22	00:52:47	40:32:41	319:42:26	55:57:02	645	1290	645
9. Agent	1:02:31:42	120:24:53	01:07:29	40:25:33	275:34:41	38:50:46	846	1147	302
Average	84:47:47	195:19:46	00:36:54	51:44:15	332:13:39	46:50:38	439	1079	641
Total	7:53:09:60	1757:57:51	06:50:06	465:38:19	2990:02:47	421:35:45	3948	9713	5765

Advanced Reporting - KPI generator

The KPI generator is an part of application that allows to user to create specific KPIs, in accordance with job requirements.

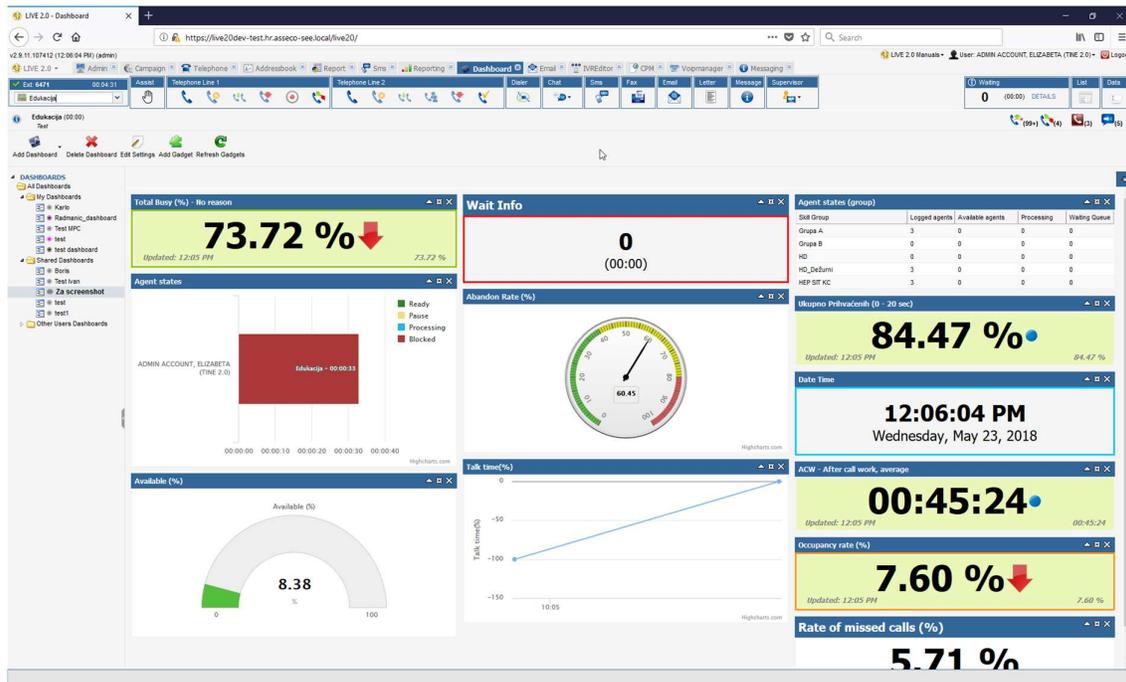
Through the KPI generator the user can define the KPIs themselves based on data available in the system and based on basic mathematical operations.

Dashboard module

Dashboard is module of ASEBA LIVE – it is a tool that is used to visually display real-time information of monitored key performance indicators (KPIs) and other metrics and information relevant to a business or contact centers.

These key data points are visualized in a simplified way and easy to read so users can be aware of their work and results they achieved.

This tool enables selections of the information that have to be displayed. It is possible to have more than one dashboard with different gadgets (KPIs). There is also possibility to unpin dashboard panel and display it on large screens in the contact center as wallboard.



GDPR module

In GDPR module LIVE 2.0 allows GDPR compliance and complete transparency in the management of personal data and any communications that came from clients on any channel, allows management of all types of data that the organization collects from the user, whether or not the data collection consent is needed. It also includes management and records of processing of data collected on the basis of contractual relations, statutory obligations or other legal basis for data collection.

PowerShifter (WFM module)

PowerShifter module is used for planning agents work time respecting predefined rules and to create agent schedules depending on the organizational units.

In creating work schedule process, PowerShifter uses historical data from contact center database. Based on these data and predefined rules, PowerShifter generate curve that meets requirements calculated based on Erlang formula. Agent schedule is generated using the curve.

Main window consists of next submodules:

- Personal schedules
- Schedules
- Organization units
- Agents

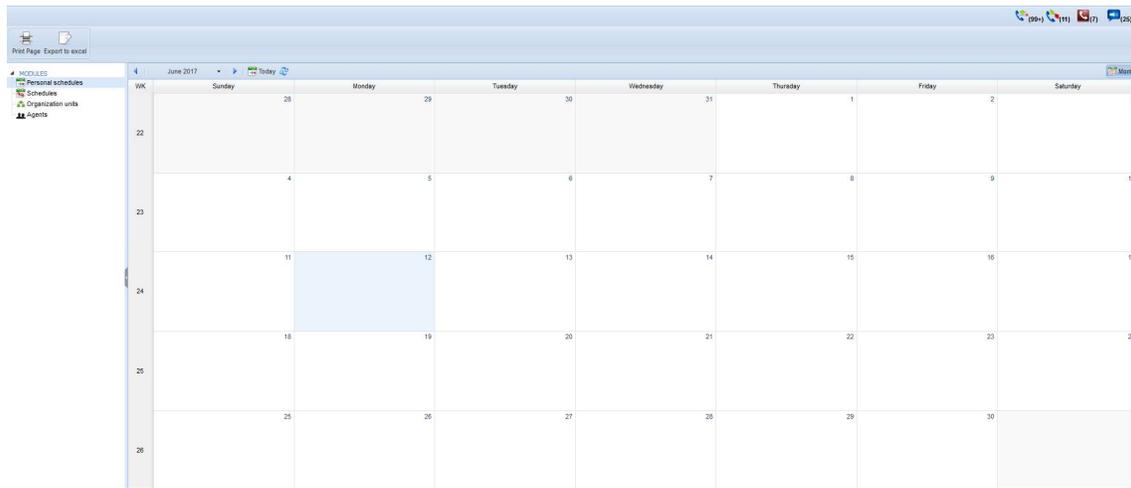
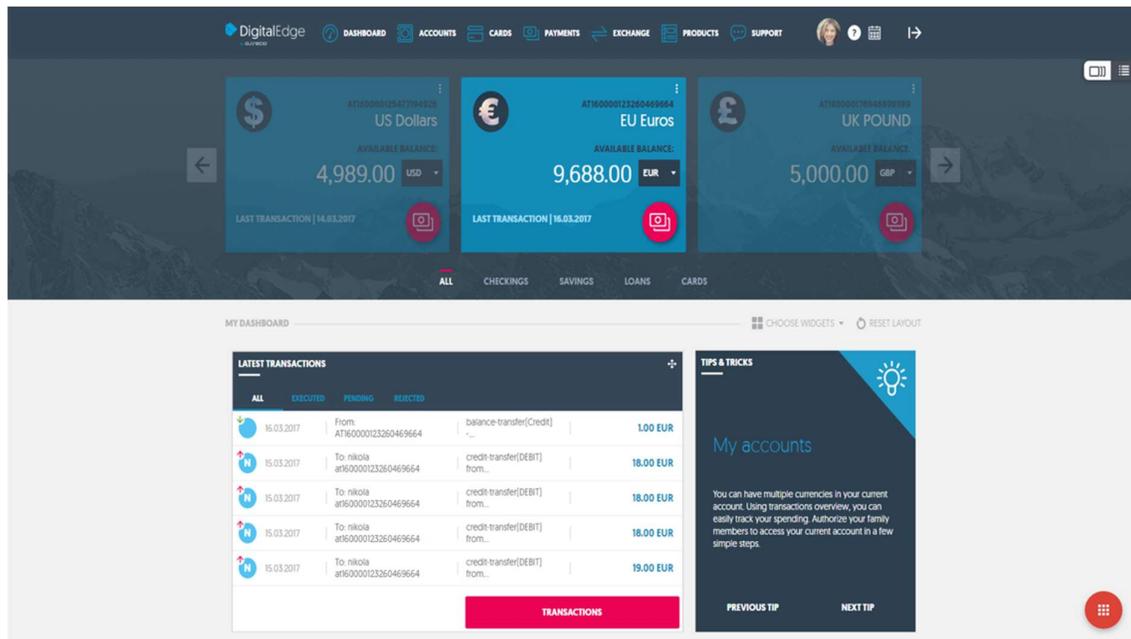


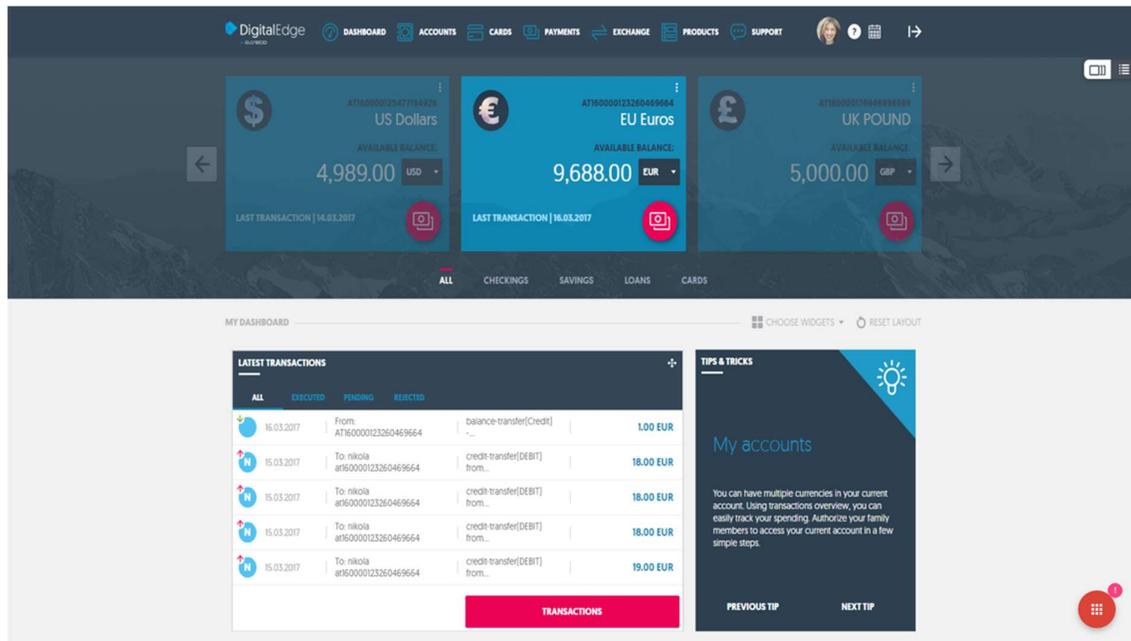
Figure 2-1

3. Virtual branch

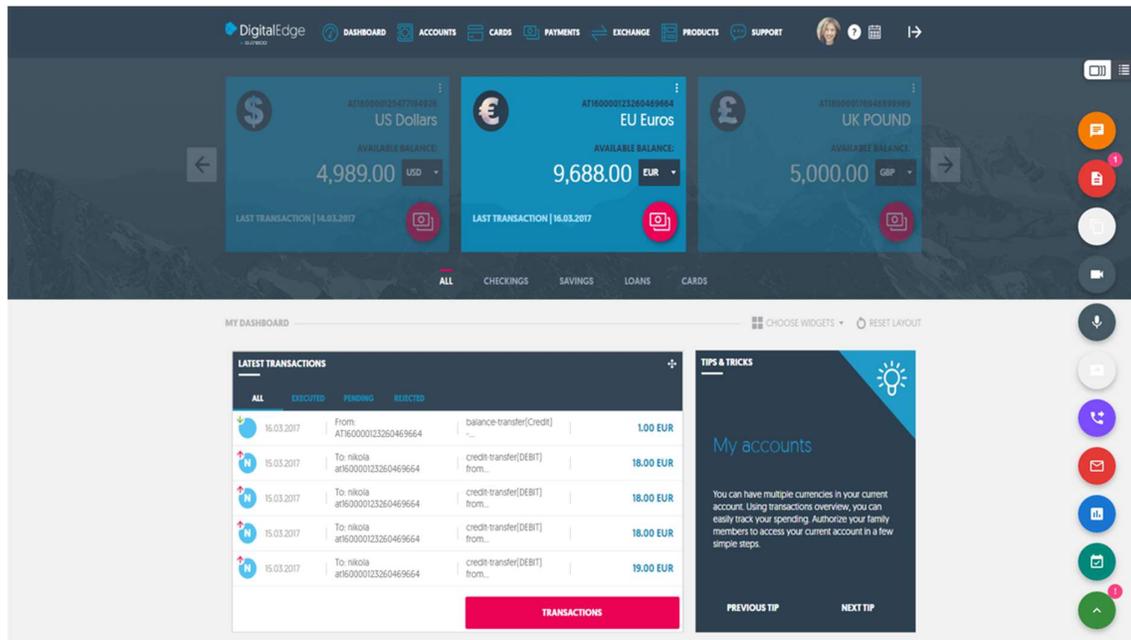
This chapter describes functionalities of LIVE Virtual Branch. As a true digital transformation of existing business, virtual branch is only accessible over Internet via standard Internet browser or mobile application.



Internet application plugin is easy to integrate and it is represented as a small (red circle) add-on in right bottom side of the existing web application. In a case of personalized usage of corporate web pages (Internet banking application or personalized web portal application), virtual branch plugin shows number of messages which are new for a logged client.



By clicking on virtual branch icon, the icon expands and provides a set of additional functionalities.



Supported functionalities are:

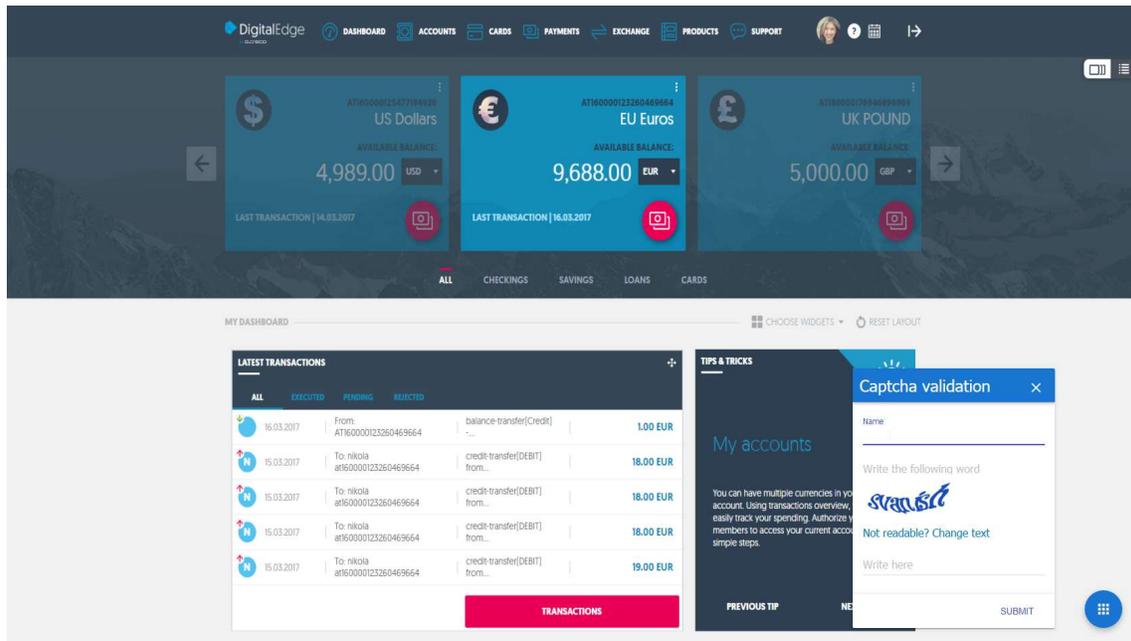
-  - Communication over text chat
-  - File management functionality

-  - Co-Browsing functionality
-  - Communication over video chat
-  - Communication over audio chat
-  - Screen sharing functionality
-  - Callback request
-  - Direct messaging
-  - Survey
-  - Meeting request

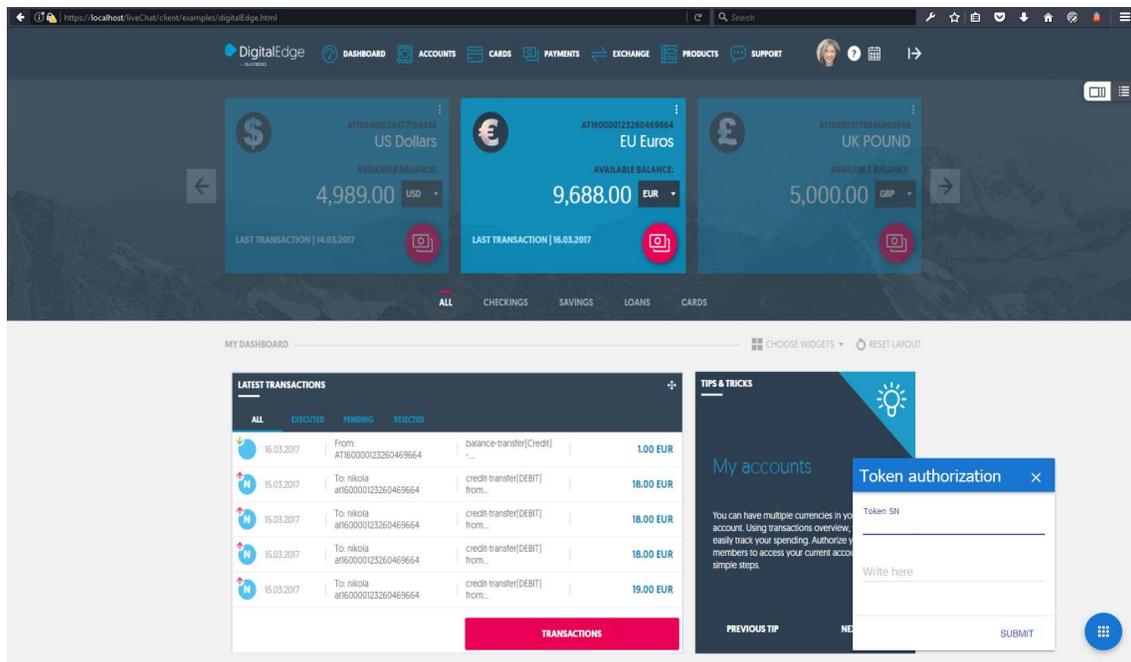
Authorization

Virtual branch provides anonymous, but also private/authorized access. The solution provides multiple methods for authorization of customers:

- Captcha – simple method, which provides challenge response to determine whether the user is a human or it is result of a malicious attack.

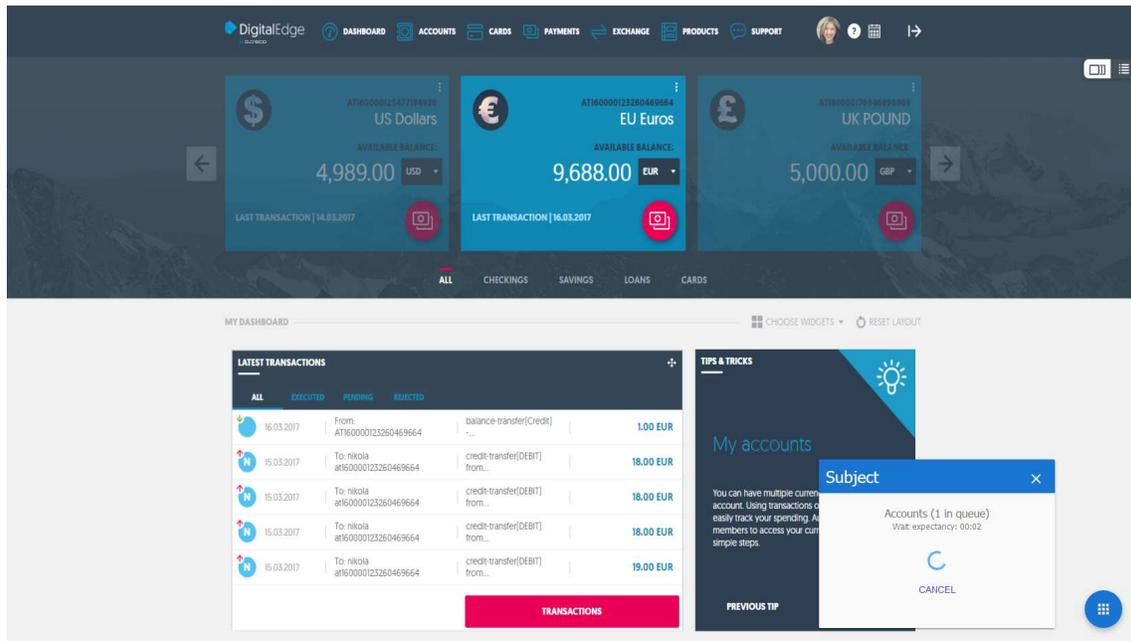


- Two-factor authentication - virtual branch provides out of the box integration with Asseco SxS, Asseco in house developed security server providing identification over different devices and methods.

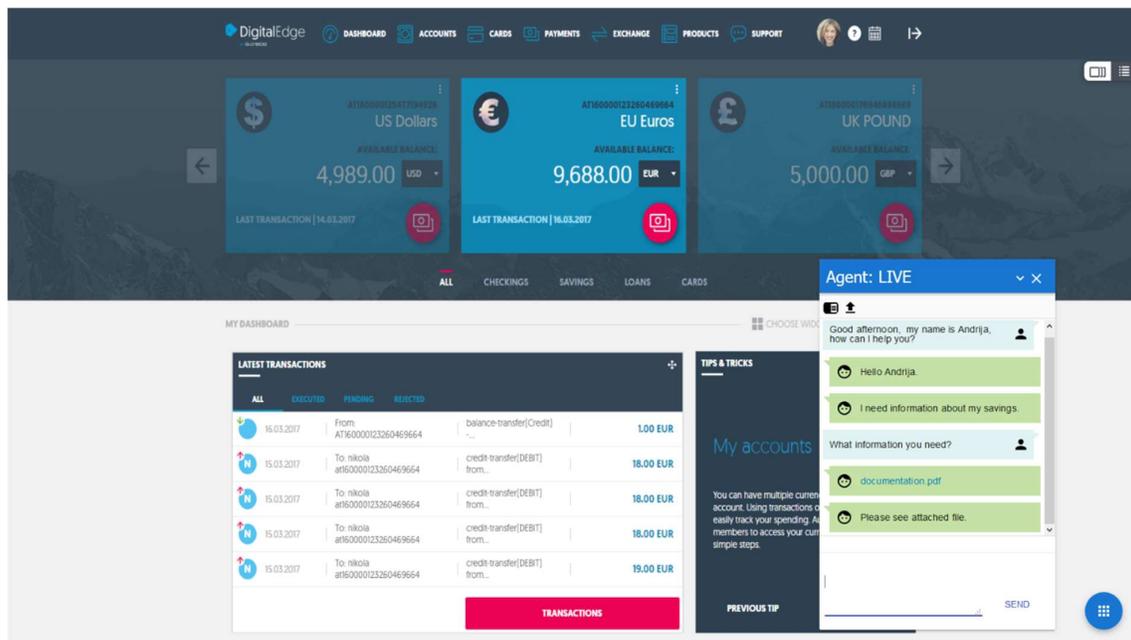


- Tokenization – in a case when the customer is already identified as in a case of Internet or mobile banking or other portal applications, the solution provides acceptance of token from superior application in which virtual branch is embedded.

Note: any other method of authorization of customer is easily customizable on request.



When first available person inside of organization is selected the conversation begins.



Provided chat component provides two additional functionalities of file transfer and download of text chat transcription.

File management

File management provides transmission of digital files through a communication channel from one computer to another. In the case of virtual branch it refers to file exchange between client and responsible person in organization or agent in contact center, and vice versa. On top of the file

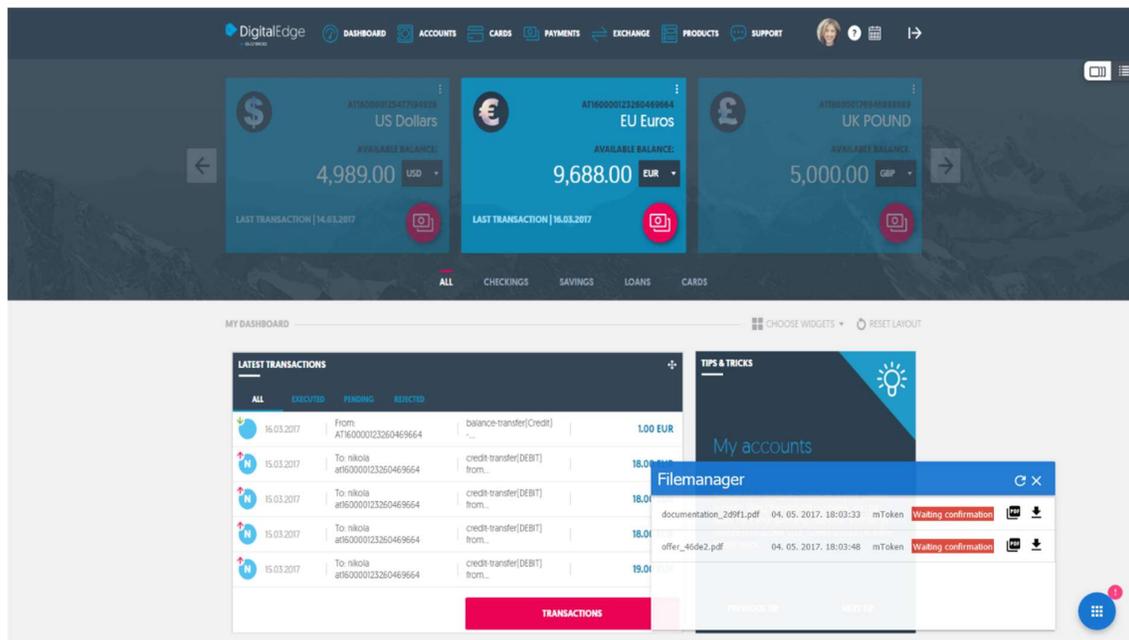
transfer this solution provides mechanism of customer approval process. Files are generally related to business proposals or to the *customer onboarding process*. File transfer functionality is suitable for usage from desktop, but also from mobile devices.

Virtual branch file transfer functionalities are:

- Bidirectional exchange of digital files
- Document approval process:
 - Manual approval
 - Two factor authentication
 - Digital certificate signature (based on eIDAS regulative)
- History of transferred and approved documents

Already established communication is not mandatory for file management part of virtual branch. Proposal in a PDF format or any digital file can be sent to the customer offline by campaign management feature of LIVE system or by responsible person in organization or agent in contact center during online communication over text, audio or video chat.

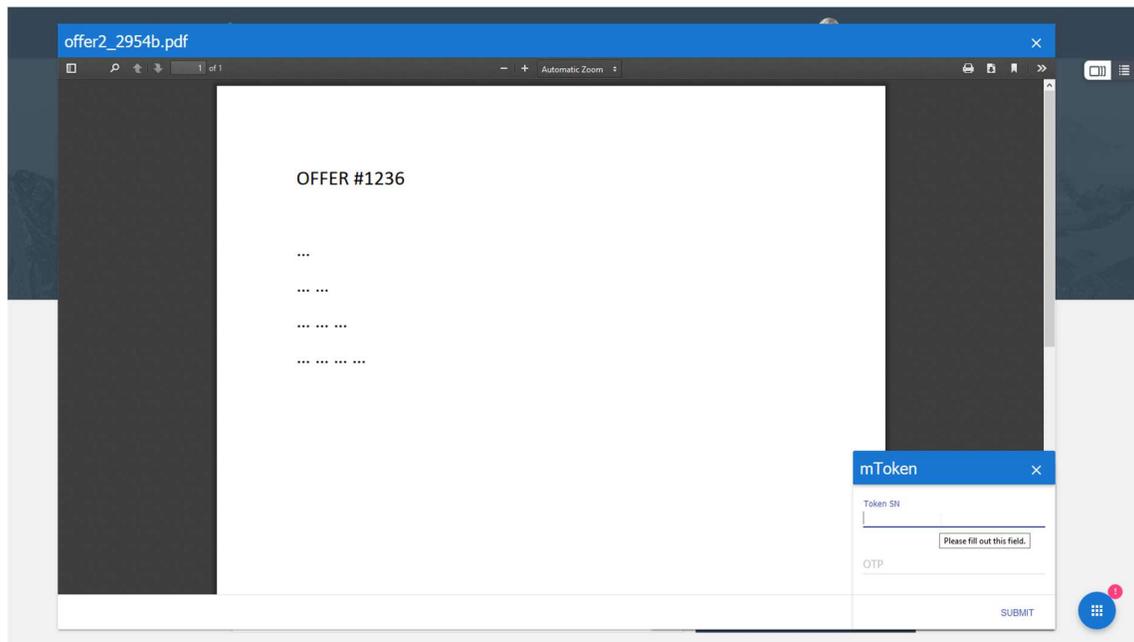
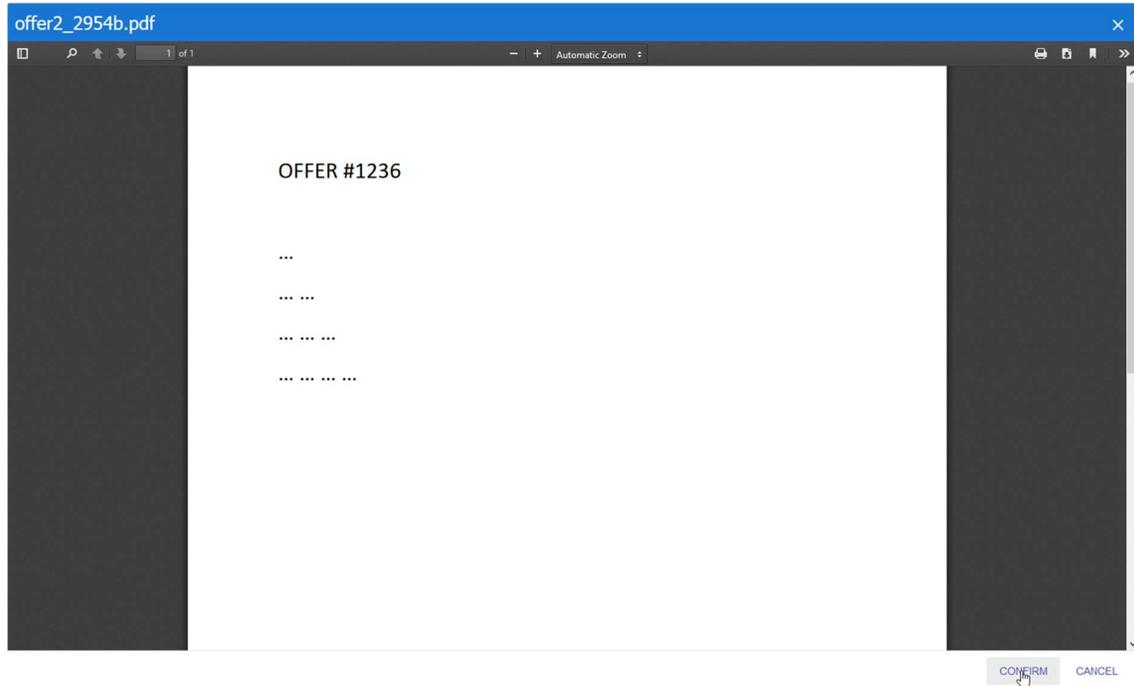
When customer selects file manager option in virtual branch menu, window with prepared documents appears. This window provides the customer access to the list of received documents and approval of each document.



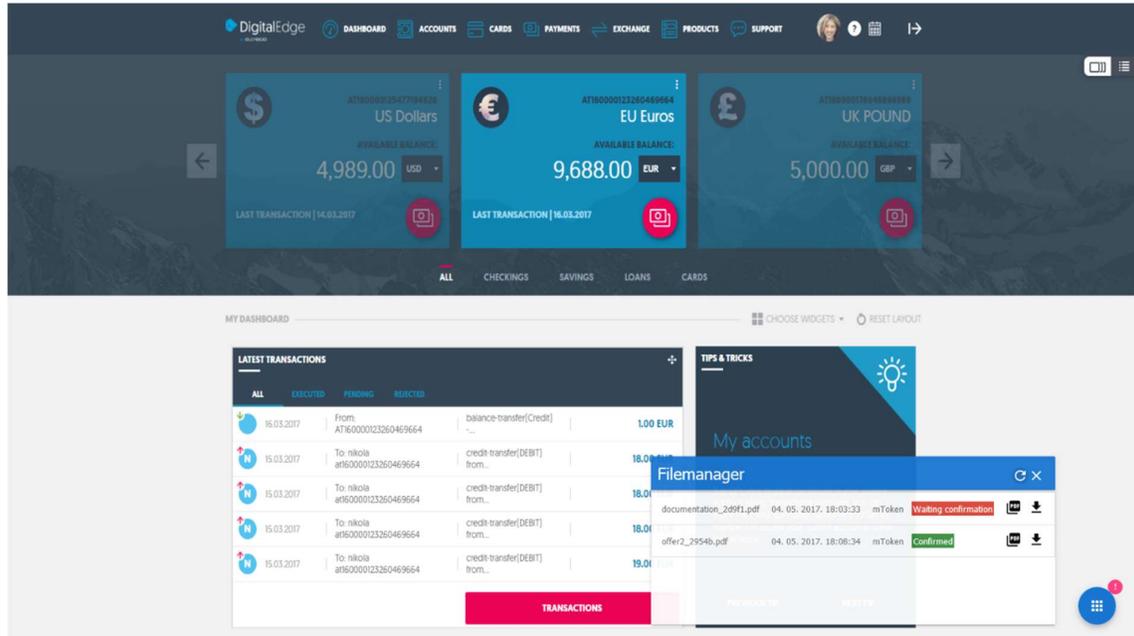
Virtual branch out of the box supports several methods for document approval process:

- Manual approval
- Two factor authentication
- Remote Digital signature (based on eIDAS regulative)

On the following pictures simple two factor approval process is shown, from opening the document to confirmation and acceptance of proposed conditions.



As a result of the approval process the list of files is updated with information that file approval is confirmed. In addition, the customer has unlimited access to its documents.



Co-Browsing

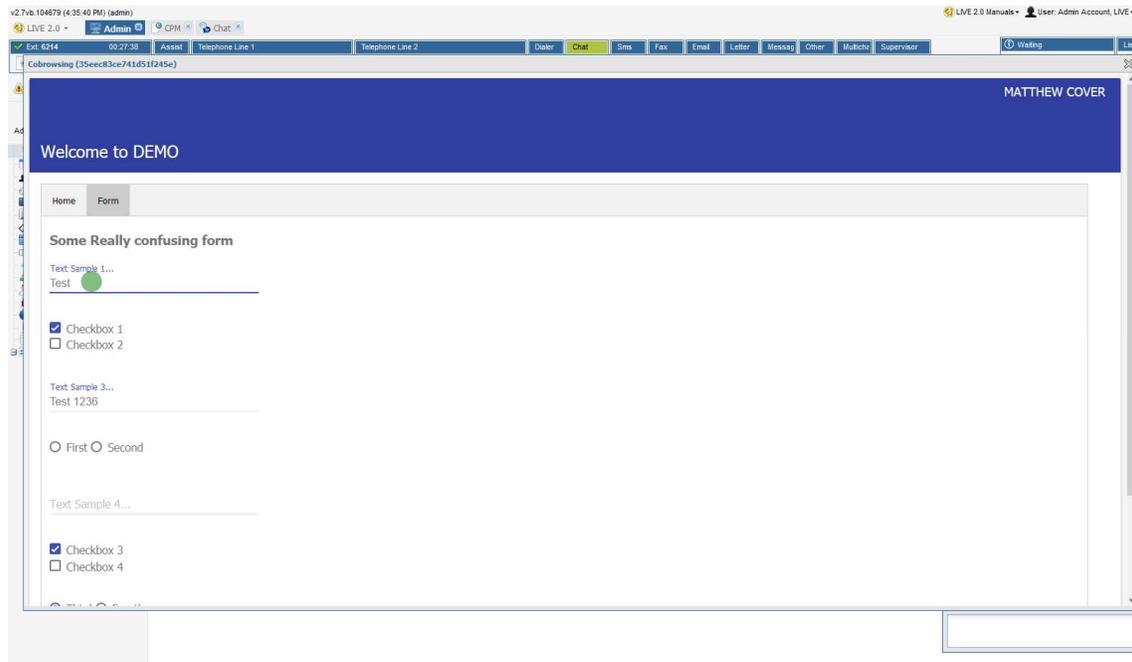
Co-browsing (short for collaborative browsing) in the context of web browsing, is the joint navigation through the web pages by two or more people accessing the same web page at the same time. This functionality does not require downloads, installations, or plug-ins. It is used for customer on-line engagement, active help in a web application environment. This functionality is used in parallel with any kind of chat communication (text, video or audio).

Note: This functionality is available only from desktop environment.

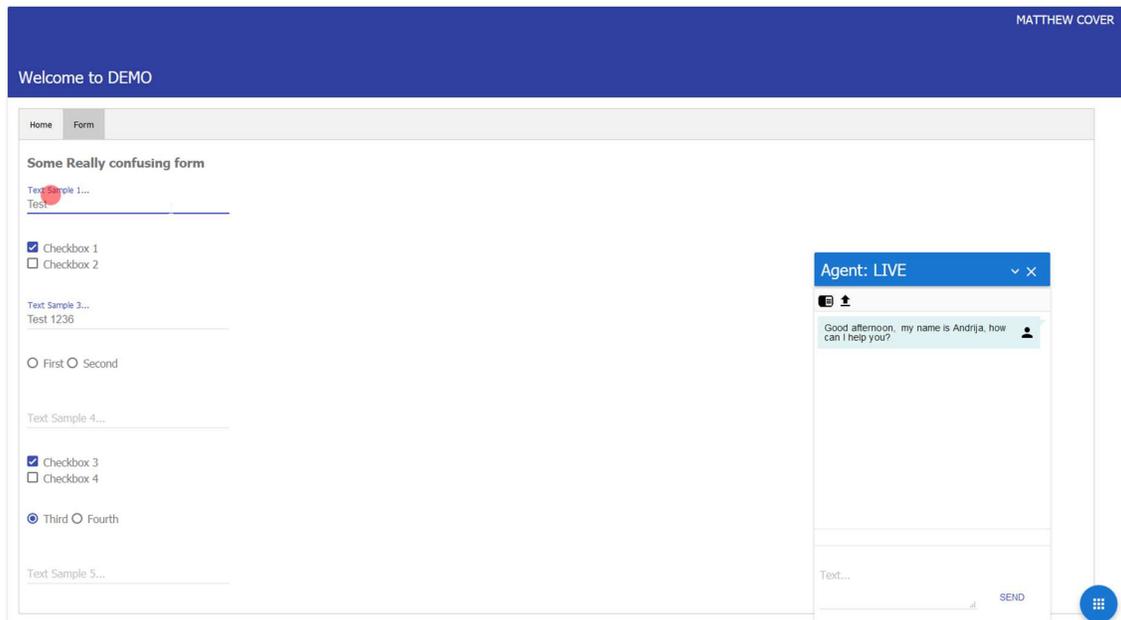
Virtual branch co-browsing functionalities are:

- Available in any kind of chat communication
- Collaborate and guide your customer
- Immediate assistance in context
- Secure
 - Agent sees web content, can't influence on it
 - Pointing out a navigation option

After established communication, customer can select option for co-browsing. This option provides responsible person in organization or agent in contact center to see or access customer's web context or web pages which the customer is currently browsing.



During the co-browsing session responsible person in organization or agent in contact center has possibility to help the customer. During web session, responsible person can navigate customer by sharing its pointer with the customer.



Note: During co-browsing session, responsible person in organization or agent in contact center cannot influence customer's web session and input data in a name of customer or he can use session just in read only mode.

Video chat

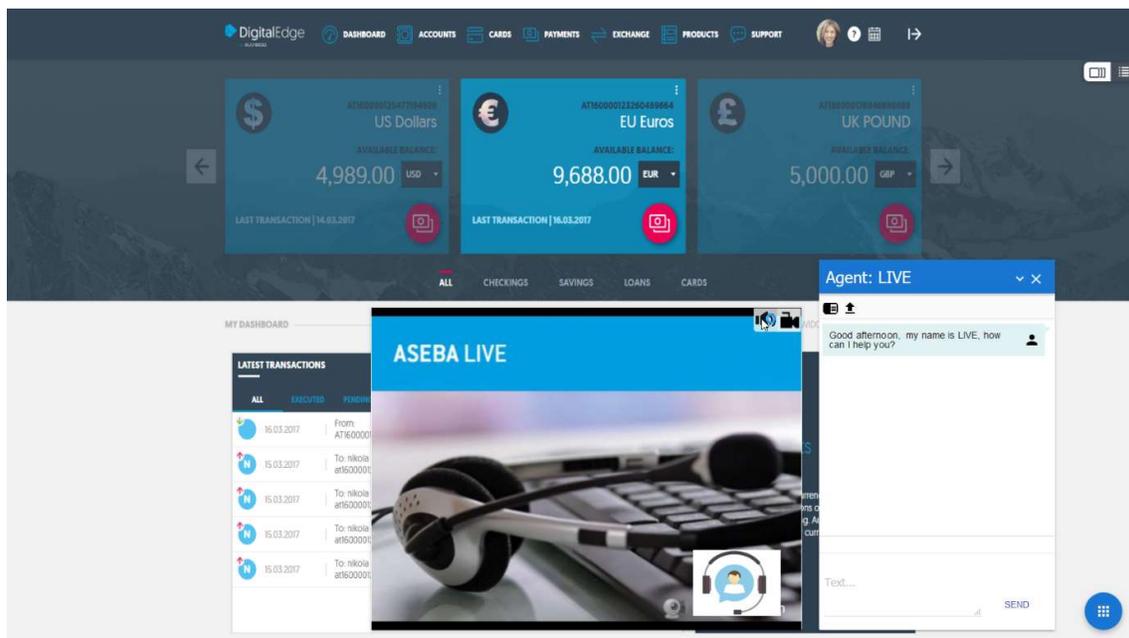
Video chat refers to a communication over the Internet that offers a real-time video call feature. Video chat functionality is connecting the customer and responsible person in organization or agent in contact center. Video chat functionality replaces face-to-face communication in a branch, thus providing live person communication in real time without asking the customer to go to a branch office. This functionality does not require downloads, installations, or plug-ins, it just uses standard HTML5 support for WebRTC protocol. Video chat functionality is suitable for usage from desktop, but also from mobile devices.

Note: Functionality of video chat uses HTML5 support for WebRTC protocol, and currently only Google Chrome, Mozilla Firefox and Opera support this feature. In addition, this functionality is available for iOS and Android mobile devices.

Virtual branch video chat functionalities are:

- Routing logic to preferred person (relationship manager or sales representative) or group
- Video call with standard features:
 - Audio only
 - Mute audio
 - Hold/off hold
 - Screen capture
 - Drop call
- Video recording

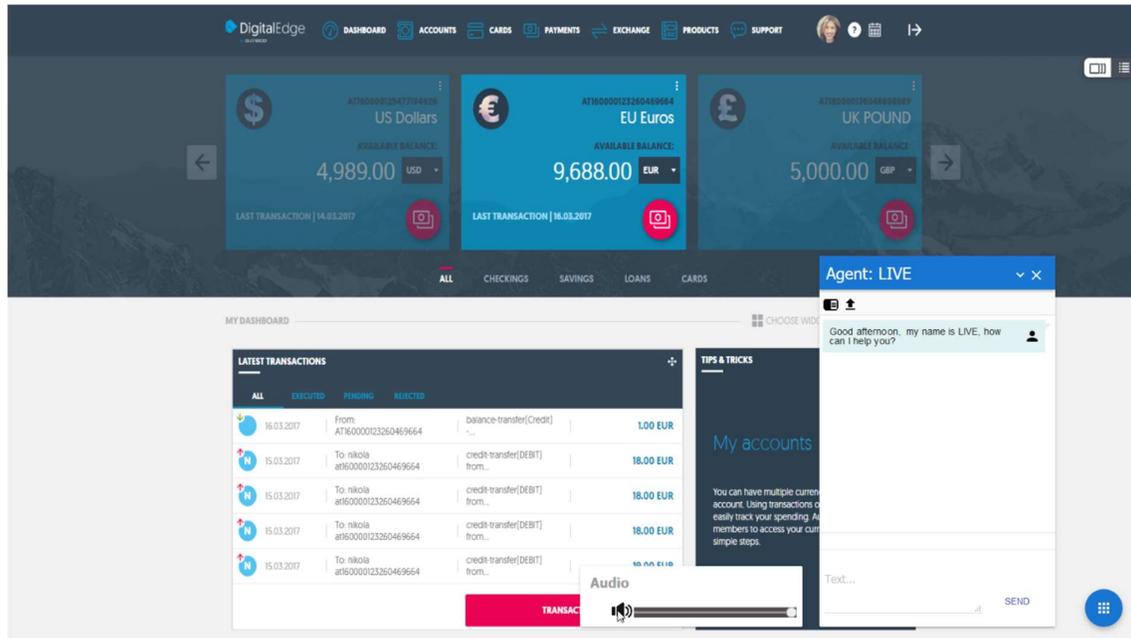
Establishing communication is similar as in the case of text chat. After communication is established video call is presented in central part of customer's window. In addition, text chat with all functionalities is also enabled. Video chat also provides functionalities of mute video and screen capture. These functionalities are provided in video chat frame.



Audio chat

Audio chat is a similar functionality as video chat but only refers to a communication over the Internet that offers a real-time audio call feature. This functionality is available for customers which

do not have a camera installed on their desktops, use Internet browsers that do not have ability to establish video communication or just prefer to communicate with audio.



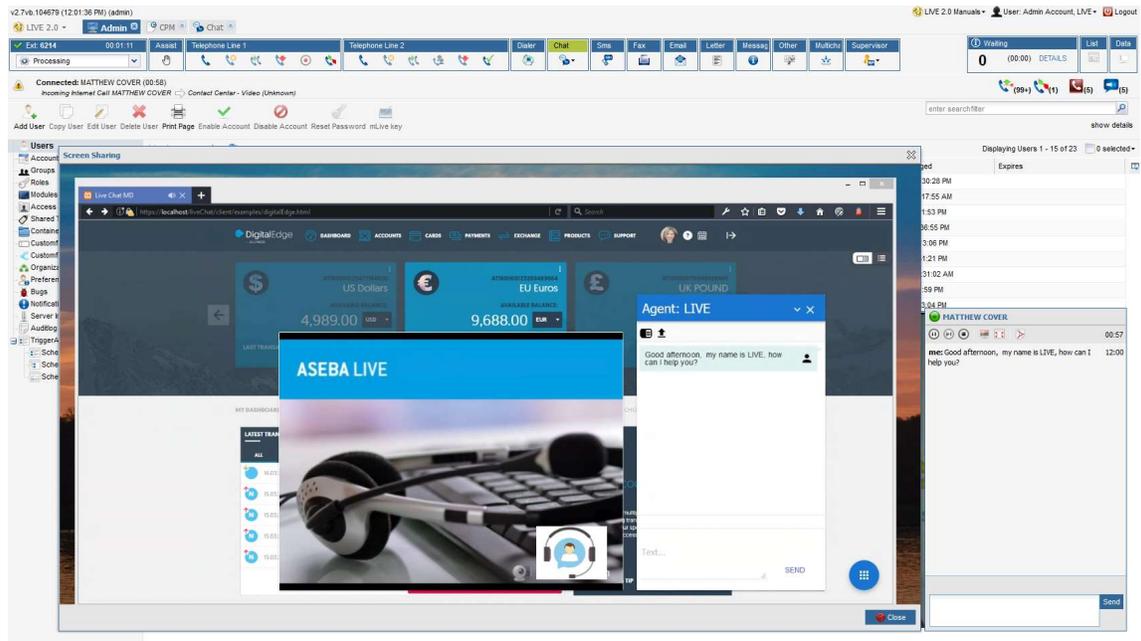
Screen sharing

Screen sharing is a similar functionality to Co-browsing but in a case of screen sharing the customer shares whole content of his desktop not just a content of web browsing. In addition, this functionality does not require downloads, installations, or plug-ins. This functionality can be used for customers requesting on-line help in a case of technical issues related to their desktop application. It can be used in parallel with any video or audio chat communication.

Note: This functionality is available only from desktop environment and communication established over Google Chrome or Mozilla Firefox and requires established audio or video communication.

Virtual branch co-browsing functionalities are:

- Collaborate and guide your customer
- Immediate assistance in context



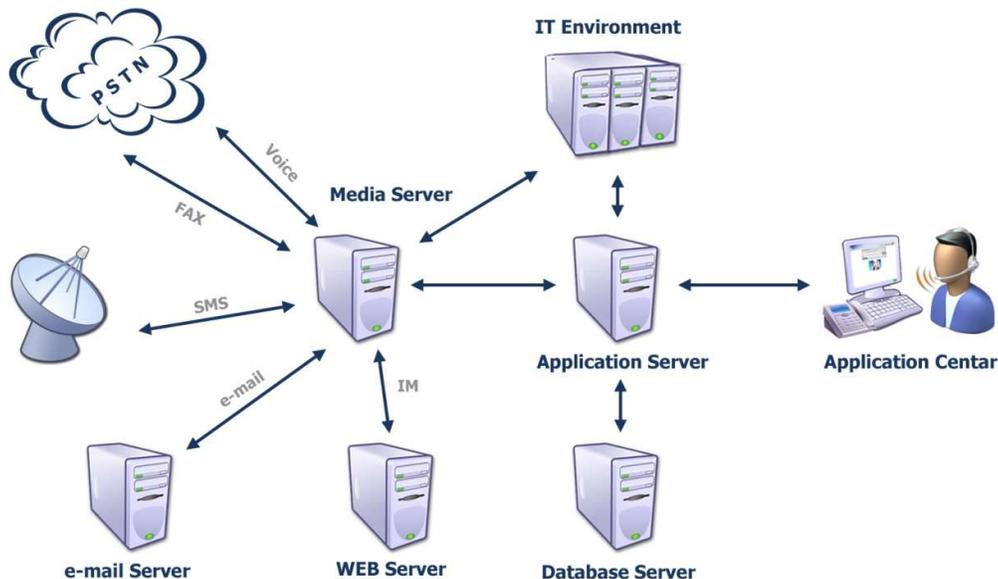
4. Proposed solution

Architecture

Logical implementation of LIVE solutions contains three servers:

- Media Server
 - Resource management
 - Signalization & Call Control
 - Channel processing (voice, fax, SMS, e-mail, IM)
- Application Server
 - Application flow & communication
 - Administration & component management
 - Integration with IT environment
 - Client applications serving
 - Data storage
- Database Server

Picture shows typical implementation of the solution.



Media Server

Media Server implements physical layer of communication towards communication environment (PSTN, GSM gateways, e-mail servers and Internet) and interprets channels information based.

It has built-in support for legacy telecom protocols (analog, ISDN, R2MF) using Dialogic telecom hardware boards as well as support for VoIP protocols (H.323, SIP) using Dialogic PowerMedia HMP (Host Media Processing) VoIP software stack. Voice information interpretation is based on VoiceXML (supports version 2.1) and CCXML (supports version 1.0).

Solution supports all open standards for SMS communication (SMPP, ParlayX), for e-mail communication (SMTP, POP3 and IMAP) and for Instant Messaging (XMPP).

Media server components run on Linux platform.

Application Server

Application Server manages solution controlling Media Server and agent communication ensuring access to client applications. Integration components within Application server connect solution with IT environment providing information for dynamic channel presentation.

Supported integration mechanisms include access to databases, web service access (HTTP, XML/SOAP, MQ, REST), host environment access (3270, telnet), authentication services, as well as file exchange (ASCII, CSV, MS Excel, PDF, XML).

Application server components run on Linux platform using Apache web server.

Client application access is done via Internet browser which allows simple application distribution across the enterprise without need for specific installation, using only agent identification for enabling required application set.

Client interfaces supports multi language.

Database Server

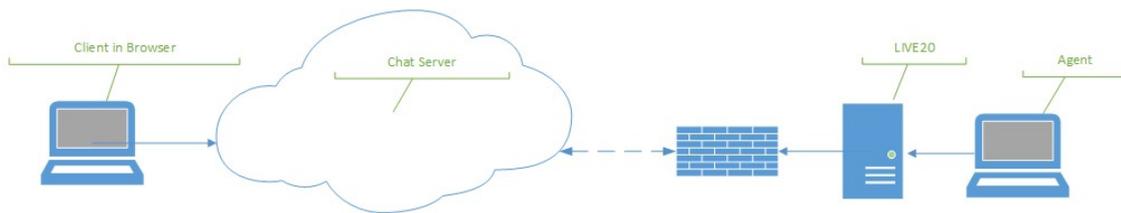
Database Server is used as data repository for solution configuration, as well as for call information storage which is foundation for statistics and reporting.

Virtual branch requirements

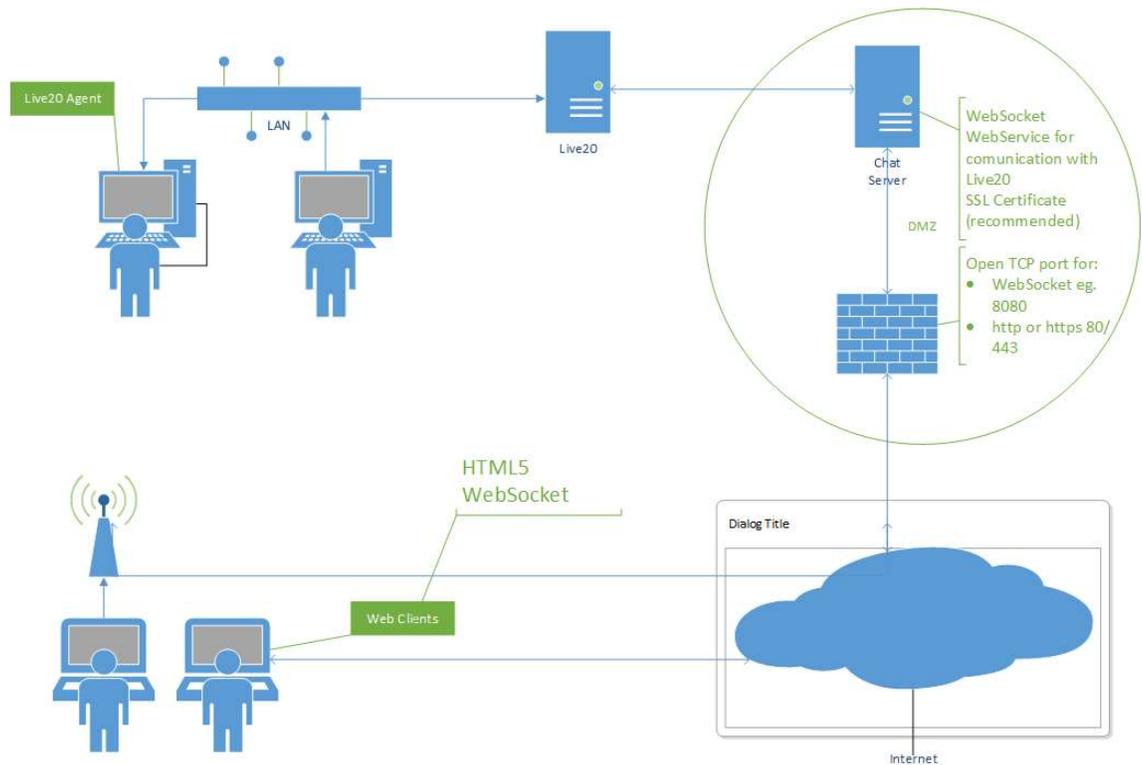
Beside proposed architecture (application server, media server, database), Virtual branch environment requires one more server – Chat server.

Chat server should be in DMZ zone, because end customer from the internet should have possibility to communicate with this server.

Following picture represents physical network design with included communication over Internet.



Following picture represents architecture of communication through Virtual Branch.



Requirements client side:

- browser with support for WebSocket
- browser with support for WebRTC (required for Videochat)

Requirements server side:

- PHP 5.6.x / 7.1.x (Ratchet for ChatServer)
- Web Server Apache / Nginx
- Redis memory storage
- Available port open on a firewall, for example 80, 443, 8080
- In order to run the system over https requirements are:
 - set a proxy to support WSS (stunnel/proxypass)
 - valid certificate

Supported protocols

For call/voice/fax solution implements following processing technologies:

- Call Control (inbound & outbound)
 - Analog
 - Digital (ISDN, R2MF)
 - VoIP (H.323, SIP, RTP, QoS)
- Call Context
 - ANI, DNIS, CLIP
- Voice playback & recording

- Supported coders: G.711 (A-law, μ -law), G.722, G.723.1, G.726, G.729a, G.729b, AMR-NB, AMR-WB (G.722.2)
 - DTMF recognition & generation
- Custom tone detection & generation
Fax send & receive (T.30, T.38 and “fax pass thru”)
Call routing & switching
Conferencing
 - Audio monitoring
 - Coach / pupil mode
 - Full conferencingConversation recording
VoIP (Voice over IP)
FoIP (Fax over IP)

For SMS communication:

- SMPP
- ParlayX

For e-mail communication

- SMTP
- POP3
- IMAP

For Instant Messaging:

- XMPP

Solution development is based on following technologies:

- C/C++
- Java
- Perl
- PHP
- JavaScript

Using the above mentioned technologies it's possible to present any information in voice, fax, SMS, e-mail and Instant Messaging form/to the end-users (call center customers) as well as accomplish contact distribution, routing and processing both for inbound and outbound contacts.

Hardware components

Proposed solution contains following components:

- IP PBX
- LIVE Media Server
- LIVE Application Server
- LIVE Application Server

Most of the components can run on VMWare customer's environment. Each component uses following resources:

- IP PBX (1 pieces):
 - OS: CentOS 7.3
 - CPU: 2 vCPU
 - RAM: 2GB vRAM
 - HDD: 30GB
 - LAN: 1
- LIVE Media Server (2 pieces):
 - Requires physical server

- LIVE Application/Database Server (1 pieces):
 - OS: CentOS 7.3
 - CPU: 8 vCPU
 - RAM: 32 GB vRAM
 - HDD: 300 GB
 - LAN: 1

Requirement for agent workstations:

- CPU: minimum Intel Core i3
- RAM: 4GB RAM
- HDD: 80GB Min
- Resolution: 1280 x 1024 - recommended

Agents have to use standard internet browsers (Internet Explorer 11, Firefox 4+ - recommended, Safari 4+, Opera 11).

Implementation

Project management methodology

The project is led by the methodology Microsoft Solutions Framework (MSF).

Key concepts of MSF model are:

- Team of equivalent members
- Mindset oriented towards user
- Thinking about the product
- Commitment to reduce errors
- Ability to learn

The principles underlying the MSF team were:

- work towards a shared vision
- focus on the business value of project
- willingness to change
- increased the powers of the team members
- foster open communication
- shared responsibility and clear accountability

