Robotiq.ai Solution Overview

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1. Solution Overview

Robotiq.ai is a robotic process automation (RPA) platform for automating business processes using software robots which is an application that can replicate human interaction with computer on UI level.

Robotic Process Automation (RPA) is a technology for business process automation. Like hardware robots used in factories, software robots automate repetitive tasks thus increasing efficiency of organization. You can also think of software robots as digital employees of a company that are performing day to day workload.

Built into your processes at a desktop or server, robots are cyber powered digital assistants, ready to take on routine administrative work so your people can focus their brainpower and attention where it's needed the most. You can run robots on top of any application and deploy them in days. No changes are needed to underlying systems and applications, and no special integrations are required to achieve quick results.

Robotiq.ai platform incorporates consulting experience and field-tested best practices, latest technologies and innovations such as artificial intelligence (deep learning) and chatbots. Strong experience combined with innovations will make Robotiq.ai the premier business and IT process automation tool for years to come. Our vision is to build software robots that are more intelligent, robust and can communicate with human employees.

Our platform contains three major components:

- **HQ (headquarters)** – Component for managing robots and editing processes.
- **Robot** – Executes processes unattended. Uses Vision Center to provide cognitive capabilities to the robot.
- **Chatbot** - Communication mediator between employees and robots.
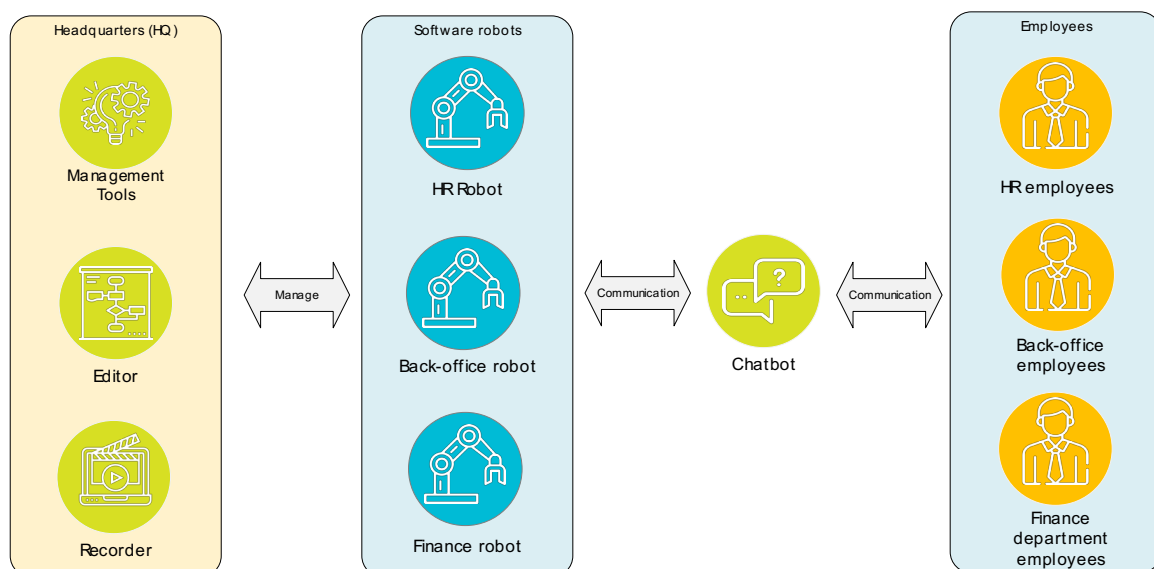

Figure 1. Robotiq.ai platform components

1.1. Headquarters (HQ)

HQ (headquarters) is a web application for central management and process design. Through HQ we enable **users** to register, schedule and monitor work of robots, **administrators** to invite and manage existing users and their security roles and **processes**, which are executed by the robots, are also created and managed within the HQ since process editor component is an integral part of this tool.

Information is presented in a visually appealing and intuitive way through dashboards that show all the relevant data on which decisions can be made. Dashboards contain necessary information to make informed decision including job execution statistics, real-time notifications and robot utilization tracking. Through **robot utilization** we can identify peaks in robot work, optimize their performance and maximize their utilization.

HQ contains several components:
- **Process Editor** – component for process, rules and validation design.
- **Process Recorder** – component for simple and intuitive business process recording.
- **Process Dispatcher** – component for dispatching and monitoring of robot work.
- **Administration & management capabilities** – component for administration and configuration of whole platform.
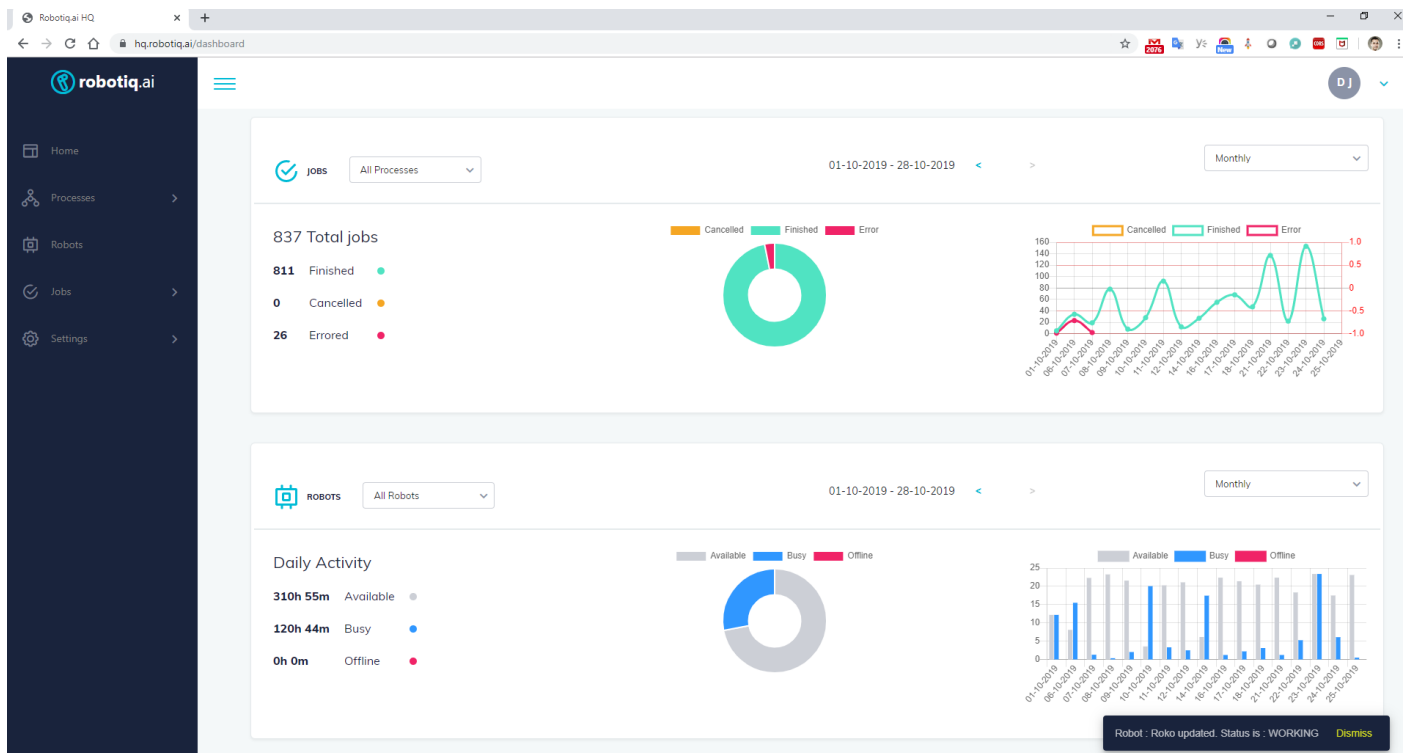

Figure 2. HQ (headquarters)

HQ can be accessed using web browsers or mobile devices since it's built using responsive design. All aspects of HQ are available through API's which enables customers to integrate robotiq.ai into their applications. For instance, robots can be started through API call which means that the robot execution can be triggered from line-of-business applications or by the end customer through self-service channels (i.e. Internet banking).

Important thing to note is that **we don't license HQ per user**, rather all users from your organization can have access to our platform. It includes technical staff, process owners and managers.

Process Editor

Process Editor as a HQ component is a web application responsible for modifying and designing processes. As web application, process editor enables users to view and change the processes from any location and any device, just using a web browser.

Process Editor enables users to design and modify the processes in an easy way and provides various activities to implement the business process such as process steps (variable manipulation, branching and loping, working with Excel, database and others), validations or chatbot activities to implement human/robot communication in case of missing data, error notifications or other situations.
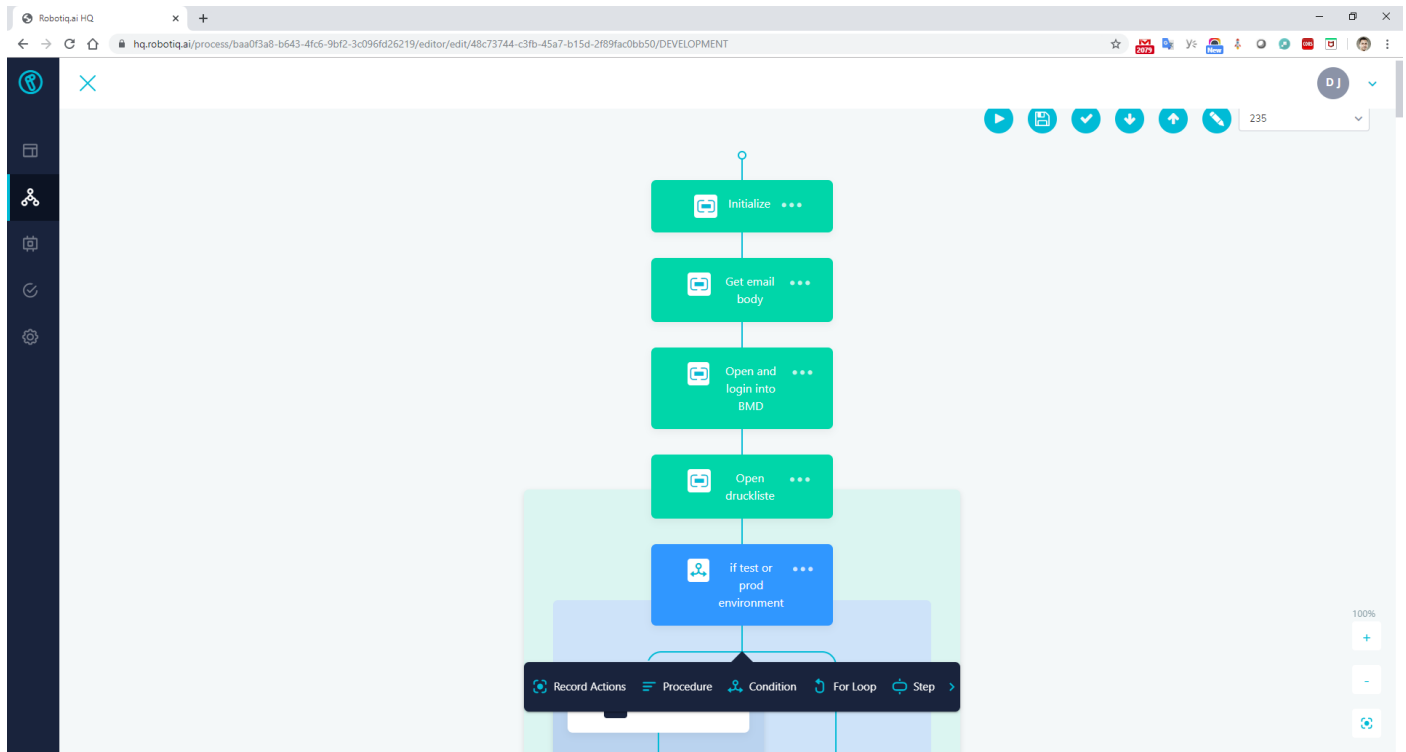

Figure 3. Process Editor

User can design processes by manually adding steps from the step library or use the recorder which can significantly speed up the process design. Steps can be grouped or can be extracted as procedures to simplify maintenance and promote code reuse.

All changes to the processes are versioned and there is a process lifecycle which goes from development to test to production stages. To enhance maintainability of the process there are several features that can be useful:

- Uploading documents related to the process (process, technical and operational documentation)
- During process creation user can identify which applications are used within the process to support better change management
- Capturing of process KPI's (duration, frequency, cost) which is used to track savings post deployment

Process Recorder

Process Recorder as a HQ component for simple and intuitive business process recording is used to simplify the process of creating a software robot. As a desktop application, process recorder can be triggered from the HQ when process is created. It is guided by a logical wizard sequence of steps and events that improves user experience and it works with any type of application (desktop or web) which gives it the importance and simplicity of using the entire platform.
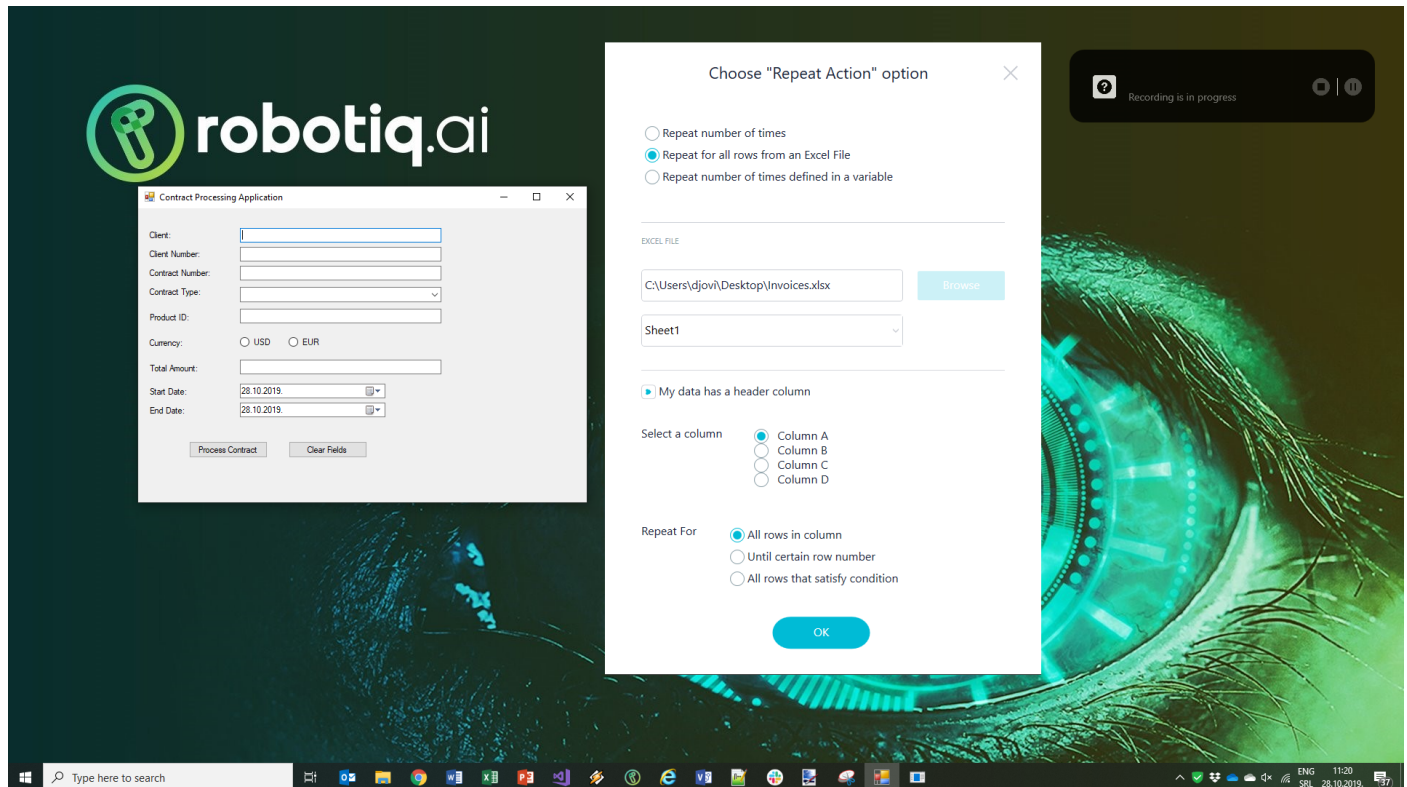

Figure 4. Process Recorder

Primary goal of Recorder is to enable non-technical users to record their process without having to know programming concepts such as loops, branches or exceptions. Recorder guides the user through the process using series of questions and wizards. For example, if the user wants to read some data from Excel and enter this data in some application (i.e. SAP) they can achieve it through simple wizard where they choose the location of Excel file and specify which rows are taken from that file. After the process is recorded it is uploaded to the HQ where the process can be edited, tested and deployed to production.

Recorder is using one of the core AI components of the platform: Vision Center. Vision Center allow the record to identify and classify the controls that the user is clicking without the use of selectors. This enables Robotiq.ai to support all application platforms such as SAP, Java apps, Oracle Forms or others. Also, we can support Citrix (Remote Desktop) environments since we are working with application purely on visual way, without the use of selectors.

Process Dispatcher

Process Dispatcher is the web application and as a HQ component is the visual layer of the platform server. Dispatcher is responsible for tracking robot status, tracking what processes need to be executed and distributing the work to the robots. The user interacts with its web pages for controlling and monitoring the robots - creating jobs, analyzing logs per robot or per process, starting and stopping the robots. Besides the web interface, Process despatcher contains also a service layer which exposes API's and makes platform more flexible and easier to use.
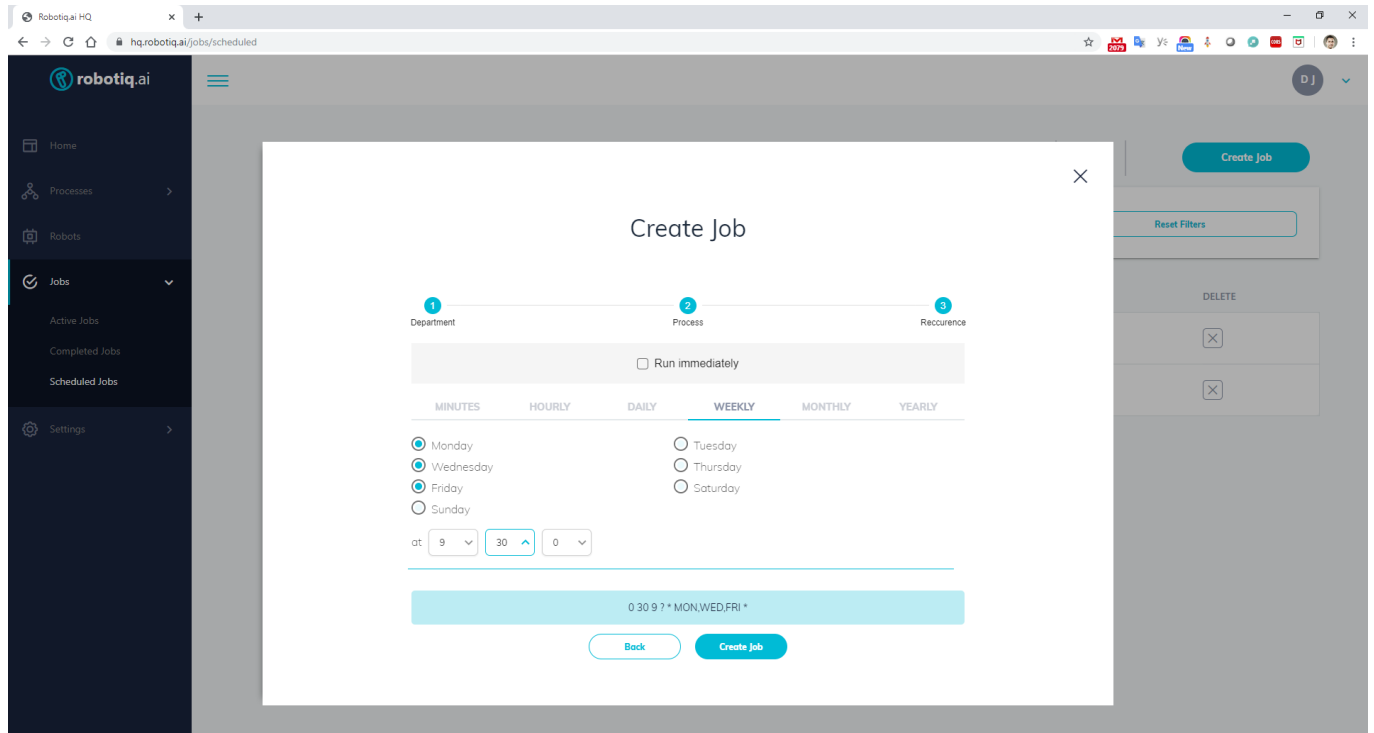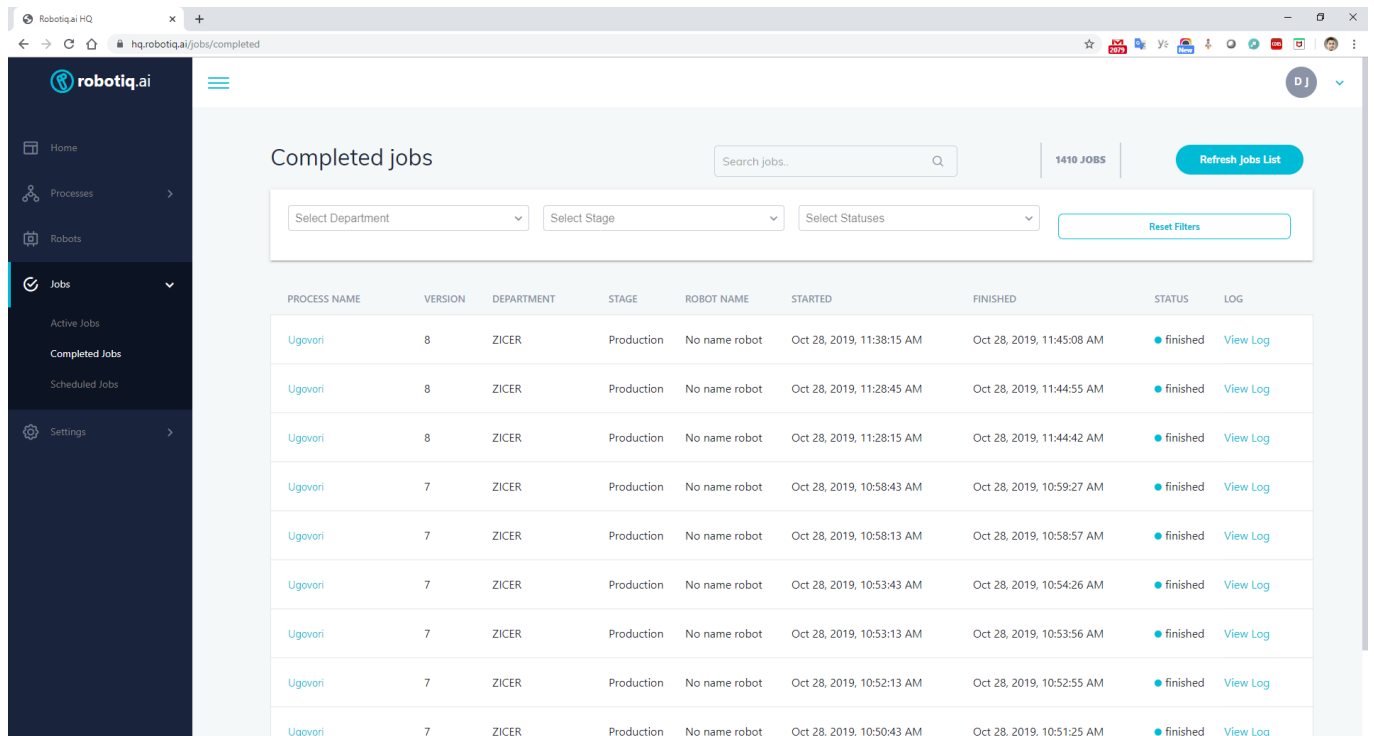

Figure 5. Creating a job schedule

Figure 6. Job execution history

Administration & Management Capabilities

Administration & management capabilities are also part of HQ component and are responsible for the whole system configuration including Organization, Department, Team, User, and Robot configuration and administration. Through this component system administrator can manage all accounts, right and responsibilities over the whole platform. This component also includes a feature to track which applications are installed on robot machines. Through Application Inventory we can simplify maintenance and change management. For example, when a certain application needs to be updated, we can check which machines are impacted and also we can use this information when we are choosing which robots will be responsible for executing a process.
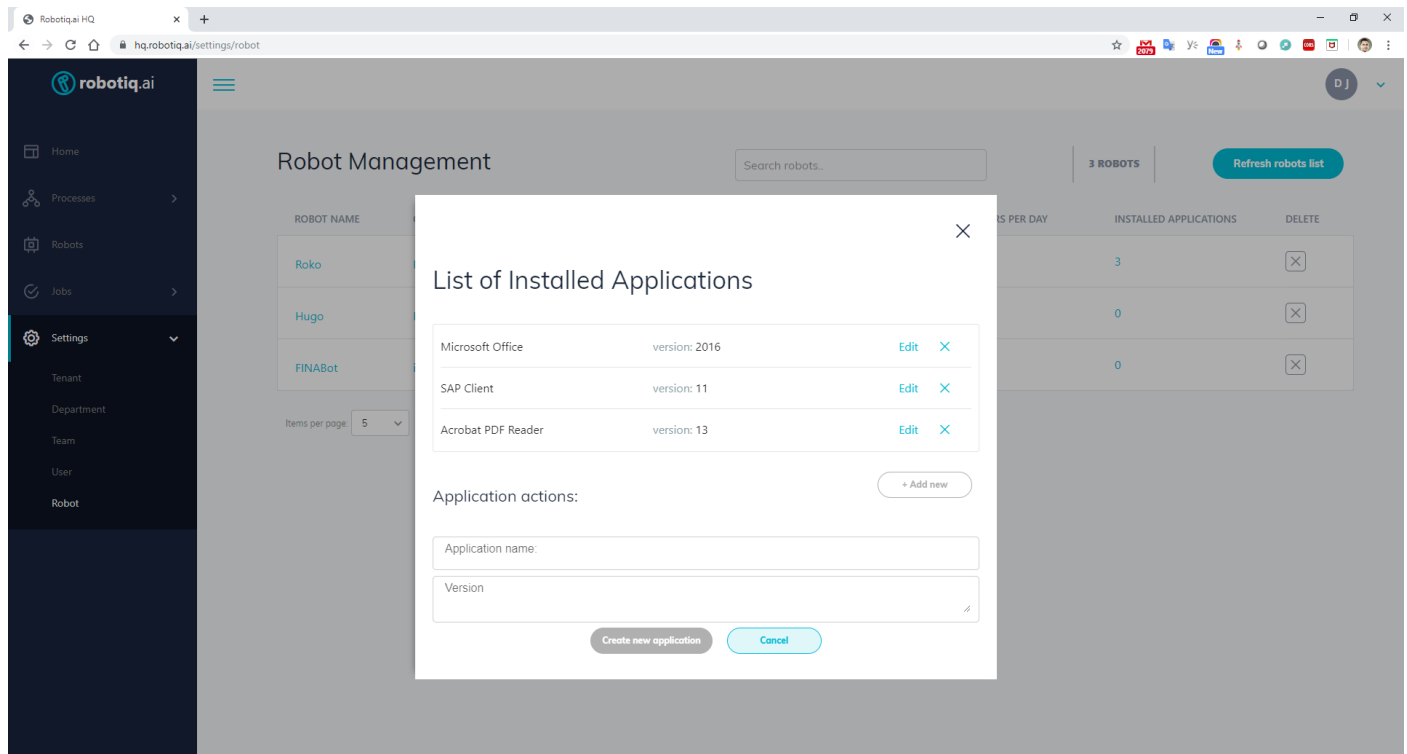

Figure 7. Application Inventory feature

1.2.Chatbot

Chatbot is a communication mediator between software robots and employees which is available through HQ component or as a standalone mobile application. There are multitude scenarios of using chatbot and some of them are:

- Starting a process
- Error or business notifications
- Data augmentation
- Approvals
- Human/Robot end-to-end processes

Often robots need some input from the human employees such as obtaining approvals, making decisions or obtaining missing data to complete the process, for that reason we are using Chatbot as a communication channel. Chatbot translates the robot request in clear text and vice versa.
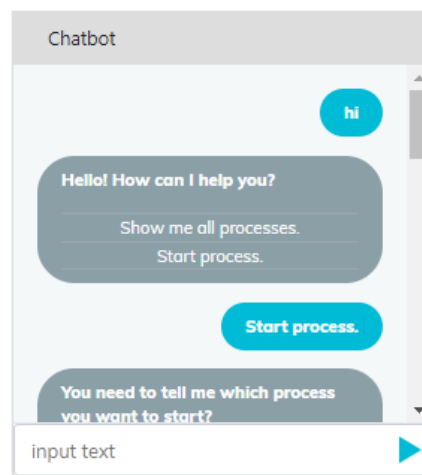

Figure 8. Chatbot

When designing process in the process editor we can for example specify that if a certain piece of information is missing that the robot should stop the execution and initiate communication to certain team or employee to get the missing data. Robot makes a request that in turn contacts the employee and asks for it. If the employee provides the feedback in the defined time the robot continues the execution, otherwise we can specify a different course of action (stop the process, skip this record, send email notification).

1.3. Robot

Robot is a desktop application which executes processes dispatched from HQ or chatbot. Process execution is completely autonomous (unattended) and requires no human oversight. In case any communication is need with human employees then chatbot component can be used. When the process is dispatched the robot logs into the computer using provided credentials and executes the process. Those credentials are encrypted in HQ and decrypted on the machine when the logon process is activated. Robot component is usually installed on a virtual machine and has a dedicated computer account (Active Directory account in most cases). One robot can execute different processes, but a single process can be executed at a time to avoid mistakes.
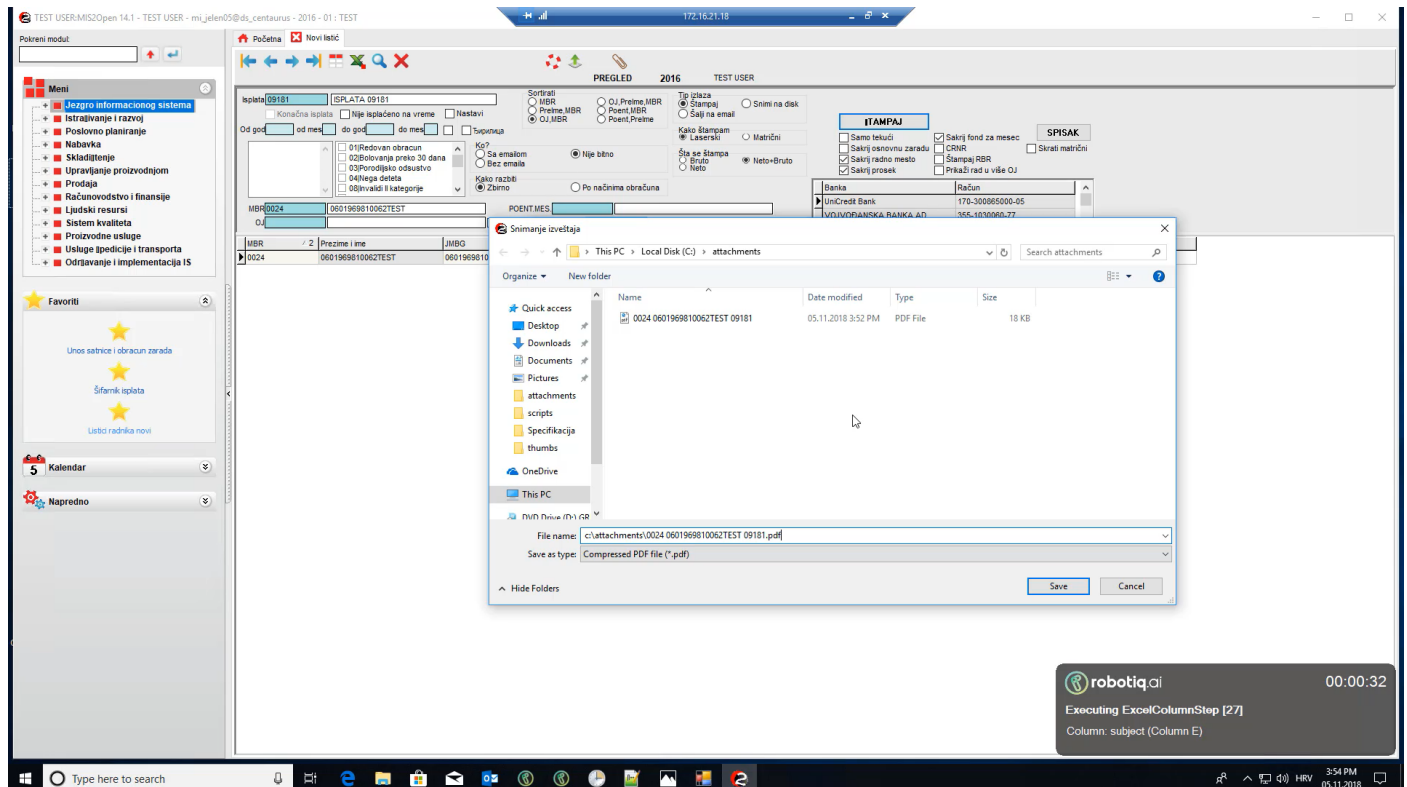

Figure 9. Robot executing a business process

Robots and HQ communicate via Rabbit MQ queueing system for the following reasons:

- **Robot status reporting (heartbeat)** – robots communicate their status (working, available, unresponsive) to HQ on a regular interval. This information is used by HQ to determine where to distribute the work
- **Process dispatching** – HQ starts the processes on robots by issuing appropriate command
- **Technical log upload** – after process is completed (successfully or unsuccessfully) technical log is uploaded to HQ. This log shows which step have been performed and any technical exception details. No business data or transactional data is transferred in this log.
- **Process execution log** – upon process completion HQ is updated with information what process was executed, on which machine, what was the result and how long did it take. This information is used to display dashboard, show robot utilization and for billing purposes (in case of pay per use licensing model).
- **Configuration updates** – when robot configuration is changed in HQ (i.e. robot changes department) those changes are propagated to the robot.

What is important to note is that by default **no business or customer data is captured and transferred to HQ**. There are possibilities to log additional events to the HQ that can include this data, rather this is implemented in the process itself.

Vision Center

Process and recorder rely on one of the most important components of Robotiq.ai solution. Vision Center is responsible to identify and classify elements within the applications. Center provides "eyes" to the robot and recorder and helps them to understand what type of control the user clicked on (i.e. button, text box, radio button…). It also helps the robot to locate the control on the screen which it needs to use. Vision Center enables the robot to be more robust in case of changes on the user interface and also provides support for various application platforms (web apps, windows apps, java, oracle forms, citrix,…).
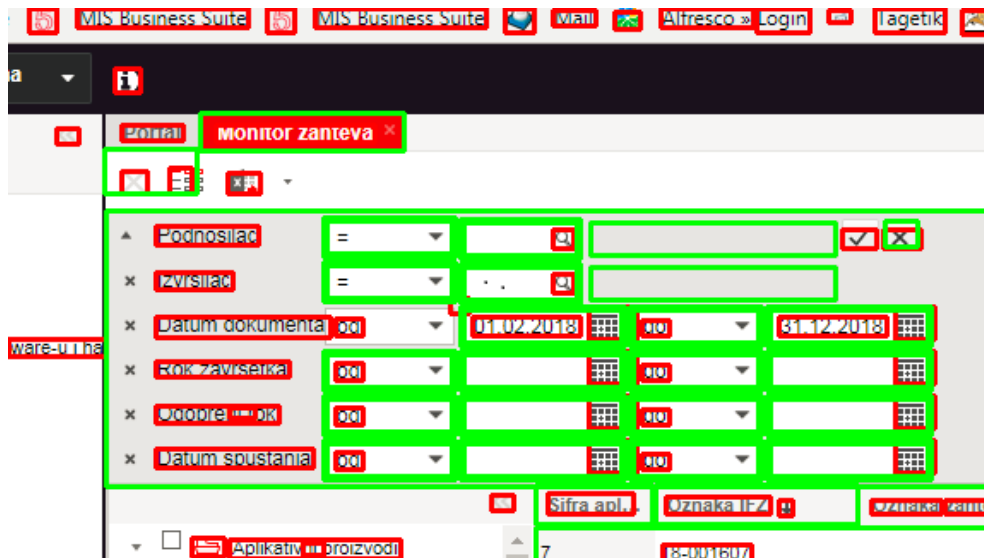

Figure 10. Vision Center detection

Usually solutions today rely on use of selectors which often cause failure of robots and are not available for all application platforms. Our solution uses machine learning and we teach the robot to see and understand applications as humans do it.

Vision Center is the first smart center in our product, but in the future, we will be adding more smart centers such as center for understanding unstructured data (scanned PDF's, emails…), learning center and others. Essentially these centers give the intelligence to the robot by providing him with cognitive, communication and learning capabilities.
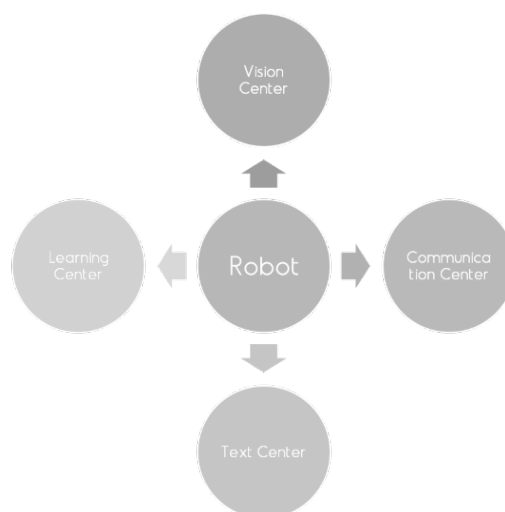

Figure 11. Smart centers of the robot intelligence

1.4.Robotiq.ai Architecture

Robotiq.ai platform offers three different deployment models depending on the customer's needs and situation:

- **On-premise -** all components (HQ, robot and chatbot) are deployed on customer environment (on-prem)
- **Hybrid** - HQ and chatbot are hosted on robotiq.ai infrastructure (cloud) and robots are installed on customer environment (on-prem)
- **Cloud** - all components (HQ, robot and chatbot) are deployed on robotiq.ai infrastructure (cloud)

On-premise deployment

Customer or partner installs all components on customer infrastructure, and they are responsible for maintaining OS, software and hardware.
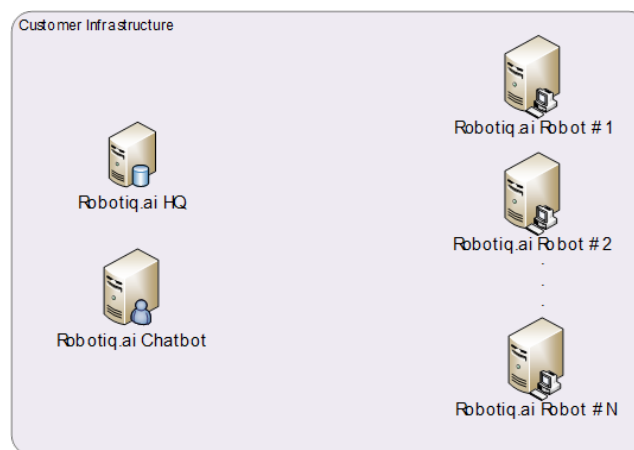

Figure 12. On-premise deployment

Hybrid deployment

Customer or partner installs robots on customer infrastructure, and they are responsible for maintaining OS, software and hardware of robot component.
HQ and Chatbot components are hosted on robotiq.ai infrastructure and are maintained by Robotiq.ai.
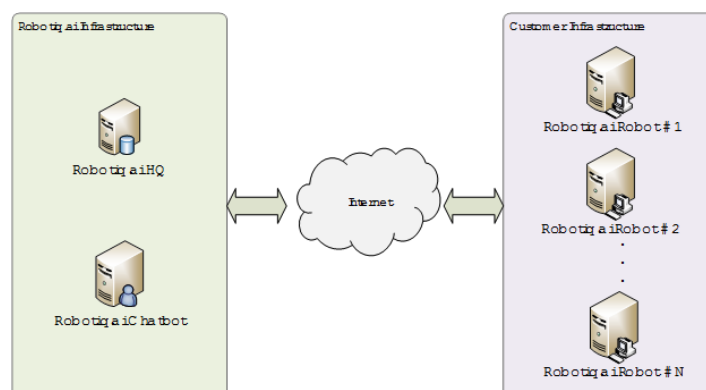

Figure 13. Hybrid deployment

Cloud deployment

Robotiq.ai hosts all the components of the platform and is responsible for maintaining them.
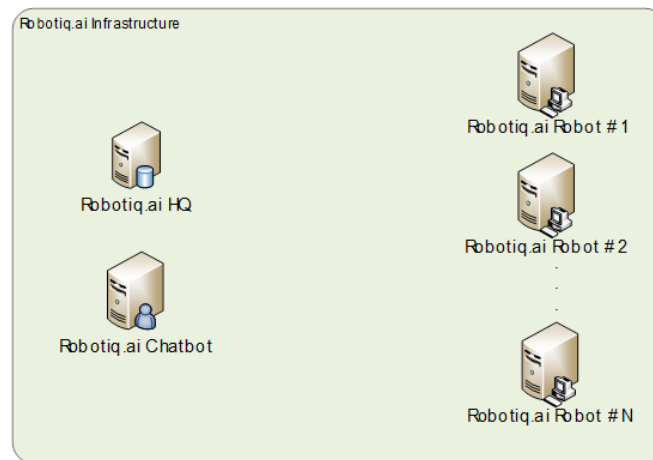

Figure 14. Cloud deployment

1.5. Licensing models

Robotiq.ai enables flexible licensing models that can fit every customer need. As a business model innovation, we are introducing new licensing models such as "pay by the minute of work" which enables companies to only pay for what they use. We feel that the price of the work that is performed by the robot should be tied to the cost of work in a country. That's why in our case the price of minute of work is correlated to the average cost of human workers so that business case can be positive even in the countries with lower cost of work. In those countries current products are often too expensive, so when you calculate the cost of implementation + licenses it becomes cheaper to hire more human employees.

Robotiq.ai can offer three different licensing models:

- **Perpetual**
  - Customer buys and owns the license perpetually
  - Maintenance is optional and provides rights to upgrades and support
- **Annual**
  - Customer rents the licenses on annual basis
  - While paying the subscription he is entitled to upgrades and support
- **Pay per use**
  - No upfront investment
  - Customer pays only for the resources used
  - Per minute of robot work
  - Charged monthly

Perpetual licensing

- Available only for on-premise deployments
- Licenses are perpetual and maintenance is mandatory for the first year
- Maintenance is 25% of license list price
- List prices:

Annual licensing

- Annual licensing model is available on-prem and hybrid deployment model
- Customer pays annual subscription for components
- Maintenance is included in the annual subscription
- List prices:

Pay per use licensing

- Pay per use licensing model is available in hybrid and cloud deployments
- Customer pays monthly fee for amount of used resources (minutes of robot work)
- Price per minute of robot work is defined for each country based on average gross income
- Monthly charge includes maintenance and chatbot addon

Deployment licensing matrix

Figure below shows what licensing models are available for different deployment model. Switching between licensing models is permitted. Depending on the switch type a migration project might be needed.

	On-premise	Hybrid	Cloud
Perpetual	✔	✖	✖
Annual	✔	✔	✖
Pay per use	✖	✔	✔

Figure 15. Available licensing models according to deployment models