

M A X

B I L L

Modern Billing

TECHNOLOGICAL REPORT

[H1] 2020

MAXBILL
August 2020

The first half of 2020 was a challenging, yet very productive time for MaxBill R&D. In a way, the COVID pandemic has accelerated the innovation processes. Additionally, the department went through some structural and organizational changes that also enhanced its productivity.

We continue to approach the inclusion of the 3rd party frameworks, tools, and systems in the field of system integration, robot process automation, machine learning, and modern UX. Leverage of 3rd party tools directly connected to billing functionality empowers platform capabilities of MaxBill solution. The creation of the Service Enabling Platform is part of the major product roadmap of 2020. With the launch of SEP, MaxBill evolves past being a system vendor and becomes a solution that will help providers generate new offers, easily incorporate services from 3rd parties and consequently rise above the competition.

With the creation of the SEP in mind, the R&D department has put efforts into three major directions in the first half of 2020: process automation, user experience, and machine learning. The following chapters explain what technologies and in which way were adopted in the MaxBill solution and present the samples of practical usage for our clients.

PROCESS AUTOMATION

A few years ago, the Camunda BPM engine was encapsulated in MaxBill microservice chassis. With a further extension of MaxBill APIs and connectors, it enables a fast configuration of complex business processes. The implementation team, partners and clients of the company benefit greatly from such a feature. One of the first implementations of BPM workflow is Order Management microservice. It orchestrates service activation flows for Telecommunication services, which involves coordinating several networking systems, logistic parties, communication systems, users and partners. This way, MaxBill order management opens to our customers and partners rich configuration possibilities. They help to automate business processes and adjust them to the changing needs of a highly competitive market environment. The third-party systems, selfcare channels driven by web portals, bots, mobile apps have access to workflows. This way, they can play an active part in the process execution via API and message exchange via streaming bus.

Additionally, the import of BPM flows via API ensures deployment of the revised version of the workflow or introduction of new workflows into a production environment without downtime. The data transmission via messages in Kafka messaging system opens up the possibility to extend the system's landscape with new modules without impact on existing systems.

The important part is, our BPM workflow is a mature technology. It has been tried in production with the number of customers, on large order volumes: only since the beginning of 2020, more than 250 000 orders have gone through it. Therefore, it's guaranteed to succeed.

During Q2 we started to extend flows with process automation scenarios for one of our customers. Normally ordering flows require many specific details provided by the end customer, which are filled into the system by the end-user and collected by the third-party systems. Free text or limited data that come from web portals or end-customers emails, normally arrives at employee's hands for further clarification with the customer and manual entry of orders into the system.

We started to automate this process in collaboration with one of our clients by analyzing this incomplete order request data and enriching it with details that are required for ordering. For instance, if we indicate a customer and his request to upgrade service, we can validate the data and automatically collect the data required for the compilation of the proper order request by querying the missed data from MaxBill and other integrated systems. The customer's location, existing equipment, and current internet subscription can be determined automatically, after which a valid order request for further processing by our standard ordering flow is created. All of the above can be performed without the involvement of the personnel. Only in a case, the input data quality doesn't allow the preparation of the proper ordering request, the direct communication with the user is involved.

In Q3 we plan to extend capabilities of process automation by integration with the bot platform and the RPA solution.

Integration with the bot platform will allow us to simplify the process of receiving the required data from the end customer. The pilot integration of the bot platform with our business process has already been conducted and was proven to successfully make billing business processes more accessible to end customers, increase the quality of input data and level of automation.

Another planned integration is that of the MaxBill workflow engine with the third-party RPA system, to extend the existing API and interfacing capabilities of BPM MaxBill component with robots that perform user activities by capturing and entering the data from screens for routine operation.

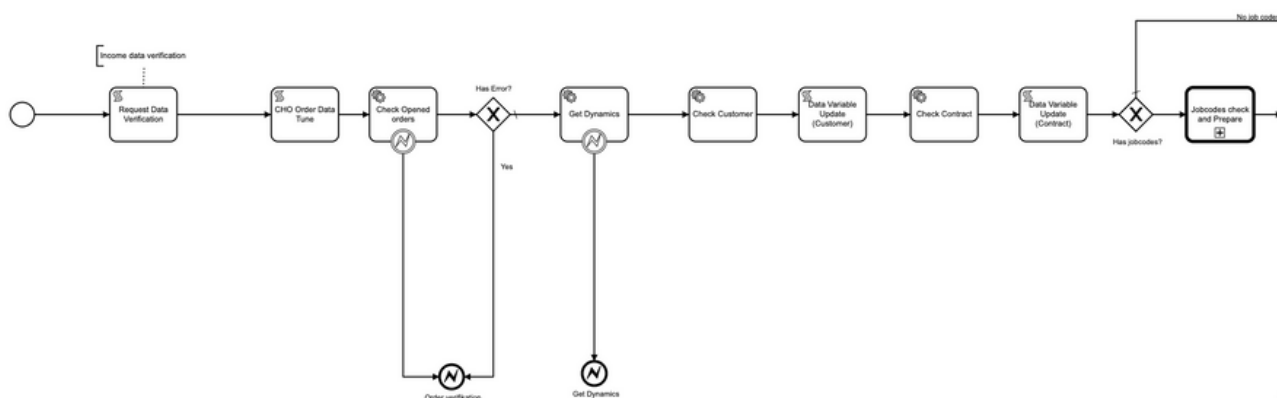


Fig. 1: the sample of BPM flow in MaxBill Order Management

MODERNIZED UI AND UX

At the beginning of the year, the new technology was selected as preferred for the UI development in MaxBill. React JS was chosen among the three most advanced JS frameworks after the precise selection process, two pilots and an architectural assessment.

In June, the first user interface, based on a new stack of UI technologies, was launched in production. It is React JS-based, fast and reliable UI, with a newly developed Screen Builder application that uses the Form IO library.

Said UI component is implemented as one of the parts of the MaxBill microservice chassis, also as the BPM component. It includes Screen rendering based on screens designed in screen builder, import of visual components, and the possibility to deploy screens into an application via API instead of compiling the new application. It allows implementation engineers and Business analysts to define screens without development skills, and link them to MaxBill APIs. It is planned to soon become a feature available to partners as well, which combined with the BPM workflow is taking MaxBill to the next step of becoming a platform.

The screenshot displays the MaxBill Screen Builder interface. At the top, there's a header with the MaxBill logo and a 'Logout' button. Below the header, the 'Create Form' section is visible, featuring input fields for 'Title', 'Name', 'Display as', 'Type', and 'Path', along with a 'Create Form' button. The main area is divided into two panels: a left sidebar with a 'Basic' tab and a list of UI components (e.g., Essential basic grid, Search Essential, Datepicker Essential, Card Essential, Tabs Essential, Bar Chart Essential, Order Overview, Loading, Text Field, Text Area, Number, Password, Checkbox, Select Boxes, Select, Check Matrix, Radio, Button), and a right panel showing a preview of the 'Order List' screen. The preview screen includes a search bar, filters for 'Order Type', 'Order Status', and 'Duration in Status', and a table of order data.

CUSTOMER N...	CUSTOMER #	CONTRACT #	ORDER #	ORDER TYPE	ORDER STATUS	CREATED
Oleg Kaluzhnyi	50221089	1213189	50158791	registration_order	Wait for Apply	28-05-2020 15:36
J.A. Coomans	50108446	1054125	50158780	termination_order	Wait for Apply	21-05-2020 09:57
D. de la Rie	50136064	1072299	50158778	termination_order	Wait for Apply	21-05-2020 09:26
S. Reynoerts	50131280	1088681	50158777	termination_order	Wait for Apply	21-05-2020 09:23
R. Brokken	50140894	1182704	50158776	termination_order	Wait for Apply	21-05-2020 09:16

Fig. 2: the sample of the Screen Builder

The new UX process established in the company is fast and efficient, introducing clear key principles and defining the product design workflow.

The starting point of the process is gathering all the requirements and defining the use cases, which should be covered by the particular design. Based on them, a specific Customer Persona is created. It helps to channel the key traits of the desired client audience, develop a deeper understanding of customer needs and prioritize which projects, campaigns, and initiatives to invest time and resources in. As an additional step, a co-design session might be conducted, to work closely with the client or partner. Though usually, it's not necessary.

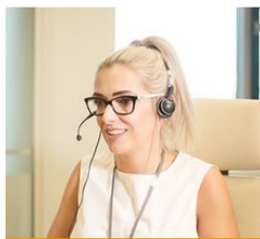
Then a defined user flow is worked out, which leads to the next step – developing a wire flow. It is a crucial point of the design journey, as it has been shown to improve the communication between the software engineering team, product owners, and users, adding to the speed and transparency of the process. It results in the precise idea of the decor of the story – the presence and positioning of the components in the interface and the output given when these components are triggered.

Wireframing and defining the set of UI elements is the next logical step. It's finalized by creating a digital product that can be tested on a group of users to gather feedback.

The UX evaluation is a necessary part of the entire process, that can prove that the end product satisfies the initial needs of the clients. It is conducted via surveys and collected UX metrics, as well as behavioural and attitudinal data.

The described workflow ensures the opportunity to observe the design solution under many angles and approaches, to secure the best user experience possible. The new order management dashboard was developed while following the above-mentioned process, with its dark theme following the brand style guidelines.

Kim, Order Manager



What is going on with orders today?

Age: 40-43
Position: Order Manager Specialist
Family: Married, 2 kids
Location: Rotterdam, Netherlands

Goals

Check failed orders
Filter the orders by duration
Export the grid data

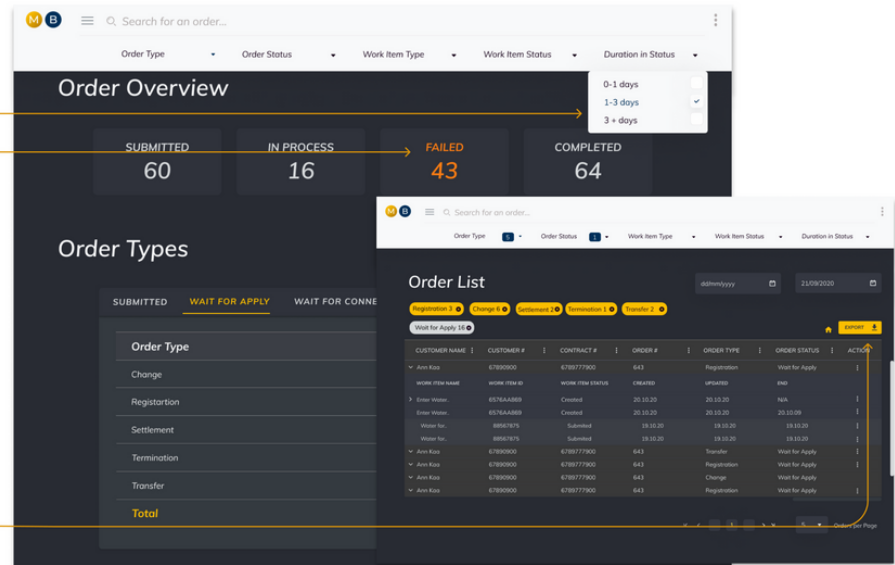


Fig. 3: the sample of the Order Management Dashboard

Importantly, since the adoption of the new UI/UX design principles, our software has already been noticed and regarded highly by FinancesOnline.



DATA ANALYSIS AND MACHINE LEARNING

We continuously invest in research, development, and adoption of the latest ML technologies into our solution. We focus on its benefits and added value to our client's businesses in the billing area specifically.

Samples of the use cases implemented recently are:

KAFKA IMPLEMENTATION FOR THE COLLECTION OF DATA FOR BI AND ML

MaxBill's interfacing solution supports two integration methods. The first one is between modules via peer to peer interfaces – a direct old-school type of interfacing. The second integration method is the use of a messaging bus, based on Kafka, and connector framework for catching the data messages by other modules. This approach is the evolution of Enterprise Integration Bus approach oriented for flexible data orchestration between systems.

An impressive case can be observed during the collection of ordering data online for scheduled import in the third-party BI system. MaxBill ordering sends messages with order details during different stages of order processing to Kafka, where the connector collects relevant data to then parse it, and uploads it into the Oracle databases. The latter is done in a structured way, that is optimized for data analysis.

ML MODEL FOR CUSTOMER CHURN PREDICTION

The model was trained on a subset of historical billing data and tested on the snapshot of data taken during some past period. This way, clear information about customers that left the company was available to help evaluate the correctness of prediction results provided by the said model.

Sample of data artifacts: type of services, number of executed service orders, number of failed orders, average invoice amount, the average duration of order execution, etc.

Technological stack in use:

- analyze data : Jupyter, python(seaborn, matplotlib)
- data management: sql, python(pandas), extractor(python)
- model management: python(joblib, sklearn)

Combination of the following ML algorithms were included in the model:

- DecisionTreeClassifier, KNeighborsClassifier, LogisticRegression, RandomForest Classifier, VotingClassifier

The results of a control run on historical data show 97% correctness of churn prediction. We plan to enrich the model with the additional data artifacts and use it to determine the customers, which are under the risk. Consequently, they can further be included in the retention process.

CONTACT US

DEVELOPMENT

Czech Republic

LogNet Billing Czech s.r.o.
Křižíkova 148/34
Karlín
186 00, Praha
+420 222 200 300

Ukraine

LogNet Billing Ukraine
4D Shevchenko avenue
Prymorskyi district
65044, Odesa
+38 048 785 05 50

GET IN TOUCH

General enquiries

info@maxbill.com

Demo enquiries

demo@maxbill.com

Media enquiries

pr@maxbill.com

Human resource enquiries

job@maxbill.com

HEADQUARTERS

United Kingdom

Elder House
St. Georges Business Park 207
Brooklands Road
Weybridge, Surrey
KT13 0TS

M A X

B I L L

Modern Billing