Service Ticket Intelligence with SAP Leonardo Machine Learning

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SAP Leonardo powers enterprises with intelligent technologies for every business process, to create better outcomes.

- **Extend**: Industry Innovation Kits
  - Pre-integrated capabilities that accelerate solving critical industry problems

- **Optimize**: Embedded Intelligence
  - Intelligent technologies like machine learning, Internet of Things, blockchain, and analytics embedded in the applications

- **Transform**: Open Innovation
  - Best-in-class innovation with intelligent technologies powered by the SAP Cloud Platform
Machine Learning will reinvent Businesses

- **60%**
  Of human tasks will be automated by 2025

- **97%**
  Image recognition accuracy today (better than human rate 95%)

- **95.1%**
  Speech recognition accuracy today (better than human rate 94.1%)

- **$18B**
  Enterprise Machine Learning Market by 2020

**Process Automation**

Full automation of business processes, from HR to payments processing, to workflow approvals for purchase orders and sales execution

**Dynamic Analytics**

- Proactive analysis of new data types and discovery of unfamiliar patterns that provide a new level of insights

**Next-gen UX**

User experience based on voice, vision and messaging will replicate how people interact in real life and increase business productivity

Source: SAP CSG analysis, McKinsey Quarterly Report July 2016, Google PR, Microsoft PR, SAP Market Model
How SAP Leonardo ML helps to deliver the Intelligent Enterprise

**Open and flexible building blocks**

- **Intelligent Applications**
  - Conversational AI
  - Intelligent Process Automation
  - ML & Project Data Science Platform

On SAP Cloud Platform & SAP HANA

**Business Outcomes**

- Increase revenue
- Re-imagine processes
- Quality time at work
- Customer satisfaction
- Enabling innovations

77% of the world’s transaction revenue touches an SAP system

26 Industries

7 lines of business

The world’s largest business network

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Machine Learning embedded in SAP Applications
70+ new intelligent scenarios planned until EoY*

Artificial Intelligence

Sales Capacity Planning  Customer Behavior Analysis  Sales Automation  Customer Negotiation  Intelligent Asset Optimization  Predictive Engineering Insights  Root Cause Analysis with ML  Dispute Optimization  Automatic Floor Plan Extraction


Detect Abnormal Liquidity Items  Accruals Prediction  Image-based ordering  Defect Code Proposal  Onboarding Recommender  Wrong Timesheet detection

Career Path Recommender  In-app assistant  Recommend similar candidates  Identify Internal Talent  Supplier Deduplication & Enrichment  Supplier Risk Modelling  Expense Bot

Guided Buying  Sentiment Analysis  Price forecasting  Sourcing Recommendation Engine  Supplier Deduplication & Enrichment  Price forecasting  Supplemental Sources of Supply

SAP Cloud Platform

Data Intelligence  Conversational AI  Internet of Things  Analytics  Intelligent Robotic Process Automation

*Subject to change
## Missed customer service time window

### Service tickets (157)

<table>
<thead>
<tr>
<th>Status</th>
<th>Ticket Number</th>
<th>Description</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>6821</td>
<td>Missed appointment by your service team</td>
<td>Open</td>
</tr>
<tr>
<td>Normal</td>
<td>6822</td>
<td>Problem</td>
<td>Open</td>
</tr>
<tr>
<td>Normal</td>
<td>6823</td>
<td>Fridge app OS version</td>
<td>Open</td>
</tr>
<tr>
<td>Normal</td>
<td>6824</td>
<td>Fridge door does not close properly</td>
<td>Open</td>
</tr>
<tr>
<td>Normal</td>
<td>6825</td>
<td>Missed appointment by your service team</td>
<td>Open</td>
</tr>
<tr>
<td>Normal</td>
<td>6826</td>
<td>Fridge door does not close properly</td>
<td>Open</td>
</tr>
<tr>
<td>Normal</td>
<td>6827</td>
<td>Need help for Wi-Fi connection</td>
<td>Open</td>
</tr>
<tr>
<td>Normal</td>
<td>6828</td>
<td>Do you really care your customer?</td>
<td>Open</td>
</tr>
<tr>
<td>Normal</td>
<td>6829</td>
<td>Missed appointment by your service team</td>
<td>Open</td>
</tr>
<tr>
<td>Normal</td>
<td>6830</td>
<td>Could not open door</td>
<td>Open</td>
</tr>
<tr>
<td>Normal</td>
<td>6831</td>
<td>Fridge app OS version</td>
<td>Open</td>
</tr>
<tr>
<td>Normal</td>
<td>6832</td>
<td>Missed appointment by your service team</td>
<td>Open</td>
</tr>
<tr>
<td>Normal</td>
<td>6833</td>
<td>Fridge door does not close properly</td>
<td>Open</td>
</tr>
<tr>
<td>Normal</td>
<td>6834</td>
<td>Strange sounds</td>
<td>Open</td>
</tr>
<tr>
<td>Normal</td>
<td>6835</td>
<td>Problem</td>
<td>Open</td>
</tr>
<tr>
<td>Normal</td>
<td>6836</td>
<td>Need help for Wi-Fi connection</td>
<td>Open</td>
</tr>
<tr>
<td>Normal</td>
<td>6837</td>
<td>Fridge app OS version</td>
<td>Open</td>
</tr>
<tr>
<td>Normal</td>
<td>6838</td>
<td>Missed appointment by your service team</td>
<td>Open</td>
</tr>
<tr>
<td>Normal</td>
<td>6839</td>
<td>I cannot wait any longer to receive my fridge!</td>
<td>Open</td>
</tr>
</tbody>
</table>
Solution! SAP Service Ticket Intelligence

Bob, Customer service champion

Benny, Billing enquiry expert

Jen, Customer

Jeff, Field Agent

Billing and payment queries

Product returns tickets

High-priority complaints

Ticket 6833

Assignee: Jeff Khoo
Support Team: Field Agent
Service Category: Technical Support
Top Recommended Solution:
- Faulty fridge door
- Faulty door magnet
**Intelligent Customer Service – Entire Journey**

**Common questions**
- Customer submits questions via virtual representative
- Chatbot addresses most common requests

**Ticket Comes in**
- More complex inquiries require human action
- Questions come in through omni-channel

**Ticket is Created**
- Created based on received information and customer profile

**Ticket is Processed**
- Manual or rule-based solution assigned to different queues or teams.
- Identify resolution manually by searching similar tickets and KBAs.

**Ticket Insights**
- Similar tickets
- Solution recommendation
- Knowledge graph

**Resolution**
- Reply to customer through original incoming channel

**Communication**
- Log support information
- Collect feedback
- Trigger billing

**Ticket Closed**
- Log support information
- Collect feedback
- Trigger billing

**Ticket is Solved?**
- Yes
- No

**Rework the Ticket**
- Customer provides new information

**Ticket Comes in**
- More complex inquiries require human action
- Customer's questions come in through omni-channel

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**Rework the Ticket**
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**Conversational AI**
- Natural language processing
- Any time, any device, any language

**Ticket Comes in**
- OCR
- Voice-to-Text
- Image recognition

**Ticket is Created**
- Ticket classification/prioritization
- Entity extraction
- Auto-assign ticket
- Predict completion time

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**Sources:**
1. Gartner Center for Business Insight 2017 calculation based on Mandate Group’s study: “CEM Executive’s Agenda 2016: Aligning the Business Around the Customer.”

50% Of customer support interactions will be digitalized or occur in online communities by 2018.

527% Improvement in customer profit margin in companies with best-in-class customer experience management.

72% Of business cite improving customer experience as their top priority.
SAP Service Ticket Intelligence
Accelerate customer service in an omnichannel front office

SAP Service Ticket Intelligence automatically processes customer inquiries to deliver best-in-class customer service.

- Improved service response times with automated processing
- Integration with SAP Service Cloud reduced time to value
- Enablement of customer service to scale with increased digital interactions

*SAP Service Ticket Intelligence does not replace knowledge management solutions.
Accelerate customer service in an omnichannel front office

Customer Reference
Pre-Processing E-mails Automatically Gives cc energie Time to Focus on Serving Customers

Business Problem
Customer interaction centers are faced with an increased volume and speed of customer interactions from rapid digitization. As a result, the service agent now has to manage much more interactions, at the same time having to meet higher expectations in terms of response times and a seamless handover across interaction channels.

Solution & Benefits
With Service Ticket Intelligence customer service agents can minimized repetitive tasks and focus on tasks that create value to the organization.

Service Ticket Intelligence automates the classification and processing of customer service requests – whether they are submitted by phone, e-mail, the Web, or chat. The application uses machine learning models to categorize customer inputs from a variety of channels into internal service groups. It also suggests service proposals, helping to resolve issues faster and improve service outcomes.

SAP Solutions Involved
The following SAP solutions are part of this use case:
- SAP Leonardo Machine Learning Foundation
- SAP Service Cloud Enterprise Edition or SAP CRM or SAP S/4HANA Customer Management

Integration
The use case can be consumed using one of the following two options:
- Native integration with SAP Service Cloud Enterprise Edition
- Integration with SAP CRM using the SAP notes 2646975, 2506240 and 2673363
- Individual integration with any other ticketing solution

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Automated Shared Service Framework

Business Problem

Shared Service Centers in organizations are often a multi-inbound channel for internal and external standard inquiries about various topics, such as when an invoice will be paid or a confirmation of a service. Therefore, this Shared Service Centers experience high workloads with queued worklists.

Solution & Benefits

With Service Ticket Intelligence the service category of the incoming inquiries can be predicted and the inquiry can be routed to the right processor for the predicted service category. For standard inquiries, such as the request for information on the status of an invoice or an address change, Intelligent Robotic Process Automation can fetch those inquiries based on the inquiry categorization and process and answer those inquiries automatically. Inquiries that cannot processed automatically are routed to a service agent.

SAP Solutions Involved

The following SAP solutions are part of this use case:
- SAP Leonardo Machine Learning Foundation
- SAP Leonardo Intelligent Robotic Process Automation
- SAP Shared Service Framework for S/4HANA

Integration

The use case can be consumed using one of the following options:
- Native integration with SAP Service Cloud Enterprise Edition
- Integration with SAP CRM using the SAP notes 2646975, 2506240 and 2673363
- Individual integration with any other ticketing solution
What happens during model training?

- csv file upload via C4C with text input and labels
- Model is initialized based on the categories found in the labels.
- Data is split into training and validation sets in 5:1 ratio.

Model training process automatically runs iterations of model training and validation to optimize the classification results across the categories found.

1. Train model
2. Validate model by comparing true and predicted labels
3. Predicted labels
4. True labels
Demo
Integration
SAP Cloud for Customer and SAP Service Ticket Intelligence

**SAP Cloud for Customer**

- **Training process**
  - Historical customer problem descriptions, service category, and related resolutions, (for example, KBAs or useful links)

- **Inference process**
  - Recommendations in solutions center for the service agent

**SAP Service Ticket Intelligence**

- **Machine learning training**
- **Run service ticket classification service and solution matching service**

- **Incoming customer service tickets**
- **Service category proposals and recommended solutions***

*Based on similar historical questions

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Pre-Processing E-mails Automatically Gives cc energie Time to Focus on Serving Customers

cc energie implemented the SAP® Service Ticket Intelligence application, part of SAP Leonardo Machine Learning, to analyze e-mails and identify which action to take such as pushing to high priority or forwarding to the relevant person. This pre-processing ensures communication is handled in the fastest way possible, helping the company maintain excellent customer service.

- Faster processing of incoming emails with AI and automated processes for sorting and forwarding – thereby also saving time for team leaders who previously managed and distributed these manually.
- Easier classification of communication due to machine learning capabilities that identify language and keywords such as "urgent", "complaint", or "CEO". Accuracy is tested and adapted on a monthly basis.
- Increased data volume on customer communication that will help with reporting, complaints processing, and further developments in the future.
- Further scope identified for use of these tools in other departments beyond data science, such as reporting and for input of paper communication.
- Simple implementation and support as part of SAP Early Adopter Care program, with expert knowledge, access to development departments, and guidance on solutions that would integrate well into existing SAP environment.

“These tools have opened up new possibilities for us. And, with SAP Early Adopter Care, we had all the support we needed, from preparing data, to training, and beyond – we couldn’t have done it by ourselves.”

Minaita Marinescu, SAP CRM Architect, cc energie sa
Engagement options

**Ready to Use**

- Available features in roadmap
  - As integrated functionality in SAP Cloud for Customer, enterprise edition
  - As a prepaid cloud subscription based on number of records (service tickets) processed on SAP Cloud Platform

**Ready to Co-Innovate**

- New features/integrations in roadmap
  - Chatbot for automated responses
  - Use cases combining Leonardo functional services with Service Ticket Intelligence
Thank you.

Contact information:

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