Dock Scheduler Optimizer
Agenda

- Introduction
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Company Background

- Camelot ITLab is a member of the international Camelot Group with its 1,600 employees worldwide, and a long-standing partner of SAP and other leading IT companies.

- From Innovations to Solutions - Camelot stands for innovation based on latest technologies and years of consulting experience, superior quality of its deliverables, and viable end-to-end solutions.

- As one of the world’s foremost IT consulting firms specializing in value chain management, we are committed to excellence in digitizing and optimizing our customers’ key business processes.

- Our offerings include custom-tailored solutions along the entire value chain – from sourcing & procurement to sales and the overarching data management.

Solution Description

- Video Link
Dock Schedule Optimizer (DSO) is a standalone cloud solution that allows self-service timeslot booking by drivers using any smart devices, tracks and traces their journey, and constantly updates their estimated time of arrival to optimize the resource schedule of the remotely placed docking stations, all in real time.

The use of cloud technology and mobile computing allows the solution to close a huge communication gap and create faster integration possibilities for new business partners.

Necessitated by the need of digitalization in the logistics network, the DSO attempts to drastically optimize the entire network operations by establishing direct communication links between different business players.
More specifically, the solution serves two vantage points, viz.,

- First that of the docking station/loading station manager with the help of an outlook-like calendar app with a detailed overview of resource utilization spread through days, weeks and months,

- and, second that of the driver with the help of a mobile web-app for maintaining personal data, booking timeslots, geo-coding and navigation using HERE maps.

DSO is the first and an important step towards achieving the complete digitalization of logistics network and can be best described by the following statement

“Dock Schedule Optimizer, a first step into logistics digitalization, is not just another quick-fix solution but a vision for a 360° digital transformation of the logistics network, and an avenue for technological disruptions owing to hyper-scale real time optimization, supply and demand matching, predictive maintenance and blockchain-based smart identity and smart contracts.”
Stakeholder Quote

“The Dock Schedule Optimization App from Camelot allows to create real-time transparency on incoming flows very fast and flexible without time-consuming integration work by making use of available smart phone technology and real-time traffic situation information system. The app supports much more detailed visibility and therefore allows to pro-actively optimize business processes and take better business decisions.

This is a new step into logistics digitalization, which enables much more agile logistics networks with direct links and coordination between involved parties and which will allow to create complete new services for our customers in the future.”

- Andreas Gmür, Partner, Camelot Management Consultants
Business Challenges

Several challenges in the logistics network necessitate the importance of the DSO. Most important of them are discussed below:

- **Less transparency due to increased business distance**

  Several contractors, sub-contractors and other players are involved in the logistics network e.g. station manager, logistics service provider, driver. Such a wide network leads to increased business distance.

- Lack of information sharing between the main process players viz. shipper and truck driver
  - truck geo-data and estimated time of arrival (ETA)
  - communication data
  - use of different telematics systems
Business Challenges

- **Unforeseeable transport events lead to mismatches in the dock resource planning**

Pre-planning, no matter how diligently done, ignores the last-minute changes at the ground level and thus, might lead to mismanagement of resources.

This is further complicated by short term unpredictable events such as
  - traffic jams
  - weather irregularities (snow, rain)
  - increased break times
  - down-times due to untimely resource breakdowns

Leading to
  - Unnecessary longer waiting times for trucks
  - Too many/ too little resources at the docking station
Challenges

Technical Challenges

- **Integration complexities with the existing system**
  - The existing use of telematics systems that require setting up complex interfaces with standard transport management solutions pose a major integration problem. This, in turn, complicates the process of onboarding new partners.
  - Developing a truly cloud-solution that is available on-demand and offers integration capabilities with existing and emerging technologies, and SAP business systems

- **Real-time communication and synchronization**
  - Enabling real-time communication among business players and real-time synchronization of resource schedules with existing system would be an extremely complex task.
  - Also difficult is achieving security and scalability while using existing system
SAP Solutions And Technology Used

- Cloud platform for application hosting including authentication mechanism
- UI5 libraries for Fiori-like UIs, Drag & Drop Calendar
- Real-time push communication services (push notifications)

- In-memory DB: Tables, views, etc.
- OData services for DB access
- XSJS for execution of procedural logic

- Maps, Truck Routing
- Real-time Traffic, Predictive Traffic
- Reverse Geocoding
Solution Architecture

Architecture Diagram

- Scheduler app
- Driver app
- Geodata and Maps
- Live data and Maps
- JavaScript API
- HERE Maps
- UIS Front-end
- Service Delegator
- Java Servlet for Push Notifications
- XS Classic Server
- HANA DB Tables
- SAP TM Backbone
- Firewall
Solution Architecture

Snapshots

- **Vantage Point 1 - Easy to use and fully integrated responsive web-app for drivers**
  - the app allows the driver to maintain his/her personal information and truck details required for checking-in to the factory premises
  - it allows the driver to navigate to the destination with the current traffic and other information
  - it also continuously updates the driver’s current location and provides timely & updated estimated arrival time to the dock scheduler
Snapshots

- Vantage Point 2 - Intuitive scheduler app for the dock scheduler / hub operator to supervise and manage dock appointments

- create new time slot
- edit existing time slots

- multiple resources view
- unassigned time slots for drivers' self-slot booking

- multiple days selection – Week or Work Week views
Snapshots

- **Vantage Point 2** - Intuitive scheduler app for the dock scheduler / hub operator to supervise and manage dock appointments
  - Indicators to show the current time slot status
    - Red color for late arrival
    - Connected and disconnected icons for driver’s current status
  - Alerts, in case the driver’s ETA is later than planned
  - Send instant messages to the driver
Snapshots

- **Vantage Point 2** - Intuitive scheduler app for the dock scheduler / hub operator to supervise and manage dock appointments
  - detail view for the selected time slot
  - driver details for the time slot
  - current position and navigation of the driver on HERE maps
Supply chain and logistics network have been at the back of the queue in terms of digitalization of their processes. DSO aims to be a trendsetter for further innovation and make a significant impact on the logistics community in how it perceives digitalization in general.

DSO completely changed

- how the business players in the logistics network communicate with each other,
- optimizing the resource and time usage and
- the technology by simplifying it to integrate more business partners in the logistics network
DSO drastically alters the entire network by reducing the communication gap between the two most distant but also the most important players viz. shipper and driver.

Though it has potential to impact the others, shipper and driver are the most likely benefactors in terms of the change it brings to their work practices.

The most striking impact it has is the way it allows these players to make decisions at the operational level which would have been difficult to achieve with the old system.
Impact on KPIs

Human Empowerment

- **KPI 1 - Time Spent**
  - Drivers spend inordinate amount of time to complete the freight orders. Other than the time that it actually takes for travel and loading/unloading activities, they spend a considerable amount of time waiting in traffic, validating themselves at security checks, waiting for their turns at overly busy docking stations, etc.
  - DSO with its agility, transparency and real-time factor minimizes the futile amount of time spent on these activities.
    - With its geo-navigation capabilities, it helps driver to navigate, know the estimated time of arrival and get lively updates for the traffic. They can accordingly adjust their break times.
    - With its pre-check in feature, very much like that at the airport, it allows the drivers to save time at the check-in gates while validating themselves at the security gates.
    - The real-time updates on the changes of the assigned loading stations, gates and their availability, the waiting time can potentially be reduced to minimum.

**DSO has the potential to reduce the order completion times by about 30%-40%. It simply means more time for the family!**
KPI 2 - Work Stress

- Large number of docking stations, keeping track of those that are out of service, high volume of freight orders throughout the day, and making sure that the shipment is ready at the right station! All these mean an extremely stressful work activity for the hub operator / dock scheduler.

- DSO with its’ high transparency helps the operator to move from a reactive “under pressure” situation to proactive planning situation

Though it is tough to measure stress, DSO takes most of the stress out of the hub operator’s work and make him feel better about his job!
Impact on KPIs

Human Empowerment

- **KPI 3 - Work Efficiency**
  - With the extent of freight orders and during seasons with high supply and demand, it becomes extremely difficult and at times impossible for hub operators to react effectively to any last minute unforeseen changes.
  - These situations also complicate the tasks of those responsible for loading and unloading shipments.
  - DSO helps the hub operator to get a real-time overview of all the loading stations, intuitively rearrange the schedule, communicate instantly within-app with the driver of a particular freight order, and track his/her current location! Everything right at his doorstep! It thus helps the operator to think less and act more by supporting him/her in making decisions. Call it operator’s very own decision support system, if you will!
  - Similarly for security guards, DSO helps to preemptively validate the driver documents, know the details of those planned to arrive at the gates they guard and react better in case of last minute changes.

  **If number of successful freight orders per day is any efficiency measure, DSO has the potential to increase it by up to 20%!**
Business And Social Value

- **KPI 1 - Efforts, waiting time**
  - Increased efforts and waiting times owing to the inefficiency of non-agile scheduler translate into bloated overall costs for the shipper.
  - DSO reduces the efforts, drivers waiting times by around 20-30% and thus the associated costs.

- **KPI 2 - Resource utilization**
  - By bringing transparency in the availability of a resource both in real-time and over a time-frame, DSO helps in supply and demand matching and thus can significantly increase the utilization of the docking stations and other factory resources. This in turn translates into completion of 10% to 25% more freight orders per unit time.

- **KPI 3 - Parking spaces and associated costs**
  - More transparency of the freight orders schedule, real-time communication with the driver and agility in its operations reduce the waiting times for the drivers (who can better plan their rest of the journey) and also the need of the parking spaces in the factory premises by about 20% -30%. Imagine the saved costs associated with these!
Impact on KPIs

Technical Impact

- **KPI 1 - Flexible and fast integration of new business partners in the network**
  - Use of cloud and mobile computing simplifies the integration of new business partners by removing the interface complexities associated with the traditional telematics systems.
  - Use of the SAP Cloud Platform for hosting the solution solves several issues associated with security, accessibility and integration.
  - Similarly, use of SAP HANA DB offers high performance capability, scalability, big data analytics required for real-time schedule optimization.

- **KPI 2 - Real time and direct communication**
  - Instant messaging between the hub operator and driver help establish the direct communication link.
  - Push notifications allow for real-time synchronization of the schedule across all its clients, be it any number of instances of any of the two vantage points viz., the drivers app or the schedulers app.
  - HERE maps geo-coding, calculation of estimated time of arrival based on live traffic updates enable the real-time communication.
Technical Impact

- KPI 3 - Technology openness to follow future business needs
  - As a next step, DSO shall include distributed apps for smart identity and smart contracts running on Ethereum blockchain that will require integration with the SAP Cloud Platform.
  - Use of such distinct technological landscapes all to achieve the single goal of digitalization significantly raises the bar of innovation in this architectural design.
Fit To The Process Innovation Track

DSO with its digital empowerment of individuals in the logistics network is a perfect fit to the ‘Process Innovation’ track by the virtue of its ability

- to enhance process transparency for the main process players
- to optimize the process to reduce costs, efforts, time and increase resource utilization
- and open architecture in a way that is agile to future changing needs
Conclusion

- Camelot offers a digital solution framework to guide the organizations through their digital transformation. The DSO comes as an extremely fitting opportunity to adopt and test some of the framework’s principles and guidelines. Additionally, it offers an excellent standpoint for building latest technological capabilities such as machine learning, big data analytics, blockchain among others. DSO has already played a crucial role in realization and understanding of digital transformation and it keeps doing so as it evolves.

- Camelot being a leader in value chain management, with expertise in supply chain and logistics functions, has a profound network of logistics industry bigwigs. Mainly driven by their need for such a solution, DSO has been received positively across the board and stands a higher chance of locking itself the first implementation project with a potential customer.
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