

Corporate Challenges from DOaccelerate 2020 and 2021

perpetuo		Firm Infrastructure		DEW21	
		Human Resource Management		ID LOGISTICS	
SHA SCHIFFLITHELEBICH WACHSBERG		ARDE		Technology Development	
				World of Values	
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PLANET H&O		JDT		DODATA	
Inbound Logistics		Operations		Outbound Logistics	
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		LENSING MEDIA		Service	

perpetuo

A 100% digital, smartphone-based operational solution for a complete entrepreneurial ecosystem.

perpetuo is an internationally operating group of companies based in Dortmund (Germany) and Prague (Czech Republic). Core business is consulting (within our so-called management consulting boutique) in the areas of venture management, strategy execution and restructuring. This includes strategic implementation projects, development of new markets and transnational restructuring projects as well as the development, project planning and introduction of new business models as a start-up. Our clients are Dax-30 companies.

1. Challenge Introduction

We are launching a complete entrepreneurial ecosystem with over 50 spaces (co-working space as a members' club) and need a 100% digital, smartphone-based operational solution (access management, rental of spaces/offices, billing, ...) both for us as a company (administrator) and for the users* (freelancers, startups, corporates, VCs).

2. Challenge Details

Our state-of-the-art ecosystem has freelancers, startups, corporates and VCs as potential users. They can rent individual spaces, entire offices or meeting rooms (diversified pricing model). We are looking for an end-to-end solution for the management and for the users. 100% digital.

This includes (by way of example):

- * Access management (main door on building / office door on 6th floor).
- * Capacity management (utilization of spaces/rooms/rental)
- * Billing (automation)
- * Data analysis
- * Customer Best Practices / Learnings / Room for Improvement
- * Notification management for users

As part of the challenge, we decided that we would use Tobit's "Chayns" software as the technological platform for the required application. Therefore, a solution must be connected to this platform via APIs or be based on this technology platform.

DEW21

Creation of a software solution for semantic analysis of texts in digital media, social media and blogs / forums to identify customer behavior, trends and current topics.

Dortmunder Energie- und Wasserversorgung GmbH (DEW21) was founded in 1995. As a modern and sustainable municipal partner, DEW21 stands for deep and versatile expertise in secure energy and water supply that is continuously adapted to the needs of its customers and the market. Becoming a modern life-supply company, not only classic energy products but also the supply of digital solutions in an urban context (SmartCity) play a decisive role.

1. Challenge Introduction

Creation of a software solution for semantic analysis of texts in digital media, social media and blogs / forums to identify customer behavior, trends and current topics.

2. Challenge Details

In an increasingly digitalized world, it is becoming ever more crucial to identify trends at an early stage and also to analyze the behavior of customers in the digital sphere and to draw appropriate conclusions from this. DEW21, as the utility company of the city of Dortmund, also faces this challenge. In order to tackle this, a solution is to be created within the scope of the challenge to analyze activities in various digital channels and to create reports and analyses based on this so that appropriate strategies and measures can be derived.

The solution should perform the analyses automatically and present them in reports with various visualization options. DEW21 employees should only initiate the analysis process and set the intervals at which the analyses are to be carried out and the reports created.

A mandatory requirement for the solution in terms of analysis is that it includes, in particular, online newspaper articles, blog posts, forum entries and social media. Likewise, the first step only requires the analysis of German-language texts. However, an analysis of texts in other languages in the area of social media and locally limited to North Rhine-Westphalia should also be available in the future. The solution should have appropriate filter functions (e.g., focus on a specific source, spatial restrictions, language, analysis period, and frequency of analysis) that can be used to specify or narrow down the analyses. An optional feature of the solution is image analysis (logos of DEW21 and subsidiaries) in social media. A thematic focus of the analysis should also be individually selectable. Topics could be, for example, electricity/water/gas, power outages, in connection with DEW21 as a company as well as its subsidiaries DONETZ, DOdata or stadtenergie. In a further expansion stage, a semantic analysis with regard to the tonality (positive, neutral, negative) of the contributions is also possible.

The automated reports must be customizable by employees, especially in terms of their presentation (e.g. diagrams, colors, etc.) and frequency of generation.

ID Logistics

Development of a software solution for the optimized physical deployment of personnel as well as a visualization of the workload for its control.

ID Logistics is a global logistics service provider, that is represented in 18 countries worldwide, has more than 320 locations and employs a total of 21,000 people. ID Logistics has customers in a wide range of industries, including food retail, non-food retail, e-commerce and healthcare. In Germany, ID Logistics has a total of 8 locations and over 2,000 employees and provides services in the areas of warehousing, detail packing, copacking, return management and transport management.

1. Challenge Introduction

Development of a software solution for the optimized physical deployment of personnel as well as a visualization of the workload for its control.

2. Challenge Details

Optimal deployment of personnel and the best possible planning of deployment, taking into account fluctuations in the order structure as well as the order workload and avoiding disruptions in the process flow, are critical success factors in this regard. As part of the DOaccelerate program, the Dortmund branch of ID Logistics is therefore looking for a software solution that makes it possible to deploy personnel optimally on the basis of the individual situation and parameters and to visualize and carry out the associated personnel planning transparently.

Up to now, incoming customer orders have been scheduled to the individual areas at the Dortmund site according to a standard key for the work/pick stations. This means that no (system-supported) optimization can be carried out in and across the individual work areas. Furthermore, there is currently no live overview of the capacity utilization in the individual areas. In order to solve the situation of personnel planning as well as the monitoring of personnel deployment, the challenge primarily comprises the following tasks:

- (Upstream) scheduling of available sales orders with regard to personnel deployment in the individual areas. Here, an interface connection to the warehouse management system for the export of the sales orders as well as for the import of the order scheduling has to be considered.
- Demand-oriented and cost-efficient personnel deployment taking into account the order structure
- Live visualization of the utilization of the individual work areas

The software solution should thus enable optimal resource utilization in the individual work areas (pick areas) and increase the transparency of the process and material flow by means of visualization for the control center employees, thereby supporting the planning of personnel deployment below ground. Another function that would be desirable in the software solution at a later point in time is the option to integrate individual skills of the employees and to also let these flow into the planning of personnel deployment.

Scheffler Helbich Architekten

Development of a software solution for the prediction of potential new building projects in the sectors of DIY stores, building material trade as well as bicycle trade.

SHA Scheffler Helbich Architekten is an innovative architectural office located in Dortmund and Berlin. SHA focuses on the design of commercial buildings in the areas of DIY stores & building material trade, bicycle trade, sports facilities, industry & commerce as well as administration.

1. Challenge Introduction

Development of a software solution for the prediction of potential new building projects in the sectors of DIY stores, building material trade as well as bicycle trade.

2. Challenge Details

Due to its extensive experience in the DIY & building materials and bicycle retailing sectors, SHA provides its customers with very comprehensive advice, also with regard to future space utilization and optimization. Within the scope of the Challenge, SHA would like to match its existing data-driven experience with publicly available data and information in order to learn in advance about the needs of a potential customer. In the future, this can take the consulting approach to a new level, in that a customer can be made aware in advance of a development that has just taken place at a location and the solution for this can be developed together.

In concrete terms, the challenge will involve the structured recording of public data such as the size of the plot, existing buildings (floor area), number of floors, gross floor area, small scale and clear height in the existing building stock, paved areas for parking spaces and deliveries, as well as the existing green spaces.

At the same time, it will be a question of recording the current capacity utilization, which will be obtained, for example, through mobility data, standing times on delivery, density and turnover frequency of the stored goods, etc. This information has to be linked to internal information / empirical values in order to indicate possible requirements to potential customers and to enter into discussions based on this.

The overall goal will be to develop an automated tool that alerts to planning and change needs at logistics and retail locations. One way to get there, the first step could be a tool in which a list of addresses / locations is entered to filter for potential candidates. In a second step, these locations, which are entered once, are to be checked regularly in order to identify future needs at an early stage and report them automatically. And in the final stage of expansion, the aim will be to use register entries to identify existing locations themselves, analyze them and report them accordingly.

Ardex

Development of business cases based on data from smart floors in the context of buildings and construction projects / building automation and utilization management.

The Ardex Group is a global manufacturer of building materials (especially construction chemicals) based in Witten, near Dortmund. Today, it has 53 subsidiaries with a total of approx. 3,300 employees in over 100 countries worldwide. Ardex is one of the global market leaders in the field of high-quality specialty construction chemicals and systems.

1. Challenge Introduction

Development of business cases based on data from smart floors in the context of buildings and construction projects / building automation and utilization management.

2. Challenge Details

As part of its focus on innovation and the future, the Ardex Group's innovation unit also develops applications and business models that lie outside the Group's previous and typical business areas. In the course of these activities, the Ardex Group also works together with startups on innovative technologies and business models that help the Ardex Group set the course for a continued successful future. As part of the DOaccelerate program, the Ardex Group is looking for startups that develop innovative solutions and business models based on innovative products and technologies.

Specifically, the Ardex Group has developed an intelligent floor and is in the process of launching it on the market. The intelligent floor captures the data and activities of people walking on it or interacting with the floor in other ways. The Ardex Group plans to add this intelligent floor to its product portfolio in the coming year and offer it to its customers for integration into smart home and building projects. Initial tests have already been implemented and corresponding data can be collected and used. The Ardex Group would like to use this intelligent floor to develop use cases and business models and offer various target groups value-added functions tailored to their needs.

For the DOaccelerate program, this specifically means that the Ardex Group will make the data collected by the floor available to startups and would like to jointly develop business models based on this data and their own products. The following data is collected and can be provided:

- Motion data (raster resolution 25 cm x 25 cm)
- Event data
- Dwell time

What does this mean for you? Outline your ideas & concepts and apply with a short presentation of your products & business models for the DOaccelerate program. So, how can you use the mentioned data or base your application on it? Are you interested in thinking through new use cases and putting them into practice? Then apply and work together with the Ardex Group as part of the DOaccelerate program.

World of Walas

Creation of a carbon-free and emission-free energy network for Phoenix West in Dortmund

Walas is an international group of companies specializing in the planning of sustainable urban development. Our mission is urban development in the broadest sense of the word. For Walas, urban development means more than real estate and land development. Urban development brings together activities, desires and interests of people and cities into a vital and lively whole. Our core business is effective, sustainable programming in close connection with the residents and users of cities.

1. Challenge Introduction

Creation of a carbon-free and emission-free energy network for Phoenix West in Dortmund

2. Challenge Details

We are currently facing various challenges. In addition to the current Corona pandemic, climate change in particular is a central problem. In order to counter the problem of climate change, the transition to carbon-free and emission-free energy systems is a central issue. There are already many young companies that have developed promising approaches and products for building such systems. However, they often face the challenge of testing them on a larger scale in operational use. To solve this challenge, we would like to offer young companies the testing ground and the associated opportunity to test their products and concepts for carbon-free and emission-free energy systems as part of the sustainable urban development of Phoenix West in Dortmund. We would like to discuss with you your concepts, products and ideas for our challenge and look for opportunities to implement pilot projects on site at Phoenix West.

In other words, if you have ideas, concepts, or even better, already developed products to generate or store zero-emission energy, or you are working on solutions to manage multiple energy sources in a campus-like environment, we should talk! Please surprise us with your creative inspiration.

Planet

As part of its activities, Planet GmbH supplies database-supported product lifecycle management (PLM) solutions for planners, designers and plant engineers as well as for operators of process engineering and process technology plants. The solutions cover all aspects related to industrial plants from planning, delivery and construction to structured document management and project handling in maintenance and dismantling.

1. Challenge Introduction

Creation of a solution for interactive maintenance, in particular for 3D laser scanning of rooms, evaluation of image data, detection and evaluation of structural changes and interactive information exchange and connection to existing planning systems.

2. Challenge Details

The challenge aims to create a software solution for interactive maintenance. For this, it is first necessary to capture individual, very different rooms as a 3D laser scan. The 3D laser acquisition must also be feasible under difficult conditions (e.g. poor WLAN / LTE connections, strong magnetic fields, strong shielding, or explosive areas). The goal is to create a surface model of the individual rooms, facilities and their components via 3D laser acquisition. After the model has been created, this and, if necessary, additional image material is to be analyzed using AI and the data prepared for transfer to a CAD system (AutoCAD). The most important goals here are the detection of pipe runs, separation of the components installed in them, the detection of structural changes and anomalies between two scanning / evaluation runs.

This information and analysis will be used in the two following application areas and will enable interactive maintenance:

- Maintenance tour with mobile graphical representation of the model => Augmented Reality supported recognition of a component, display of the respective TAG number on the individual components and manual recording of condition information on the component.
- Maintenance work with mobile graphical representation of the model => Augmented Reality supported recognition of a component and display of the respective TAG numbers on the individual components as well as display of the required metadata and documents for this component. Simple display and simulation support by the 3D model during assembly or disassembly of components.

Finally, the solution created is to be connected to the existing PLM solutions of Planet GmbH via APIs. The aim here is to support the areas of maintenance & installation, conversions in existing buildings, planning discussions and target/actual comparisons, which can be handled via Planet's PLM system.

J. D. Theile

Development of a measuring system for determining angles in lashing and lifting devices with wireless transmission to mobile devices.

JDT is a leading global manufacturer of complete chain systems and accessories for mining and industry, as well as a system integrator of robots in the field of industrial automation. More than 200 years of experience in materials and production is the basis for the quality of JDT products. JDT is proud to offer products "Made-in-Germany". At JDT, we are passionate about providing products of the highest quality, innovation, performance, availability and customer-oriented service.

1. Challenge Introduction

Development of a measuring system for determining angles in lashing and lifting devices with wireless transmission to mobile devices.

2. Challenge Details

The use of lifting and lashing equipment always involves the selection of suitable components. This selection is based on the determination of lifting or lashing angles, the number of load strands, the weight of the load to be lifted or lashed, and other boundary conditions such as the type of lashing or the temperature.

The challenge lies in the simple and reliable determination of the required data by sensors, the development of a compact electronic component for data processing / acquisition of the sensors and the transfer to a mobile system (computer / smartphone / tablet) for the selection of suitable slinging and lashing equipment.

For this purpose, a measuring device is envisaged that can be hooked into the corresponding device to determine the required data quickly, easily and reliably. In the process, the system must be usable for various chains with different diameters and pitches and work reliably in harsh industrial environments.

Corresponding software or an app on the end device then supports the user in selecting the appropriate products and provides additional information on the corresponding application.

There is a great deal of expertise in our company in the field of designing and manufacturing physical prototypes. As part of the Challenge, the goal is to produce a working prototype for testing. What we are looking for is a partner with the expertise in the field of sensor technology and software development that needs to be integrated into the corresponding solution.

In other words: We bring the knowledge in design and you bring the knowledge for the software and sensor technology of the solution.

Emschergenossenschaft und Lippeverband

Optimization and / or automation of anomaly analysis at discharge points of rainwater treatment plants

Rechtlich gesehen sind Emschergenossenschaft (EG) und Lippeverband (LV) zwei öffentlich-rechtliche Körperschaften mit vergleichbaren gesetzlichen Aufgaben. Wir bündeln seit mehr als 90 Jahren unsere Kompetenzen und sind das größte Abwasserentsorgungsunternehmen und Betreiber von Kläranlagen in Deutschland. Was uns vor allem verbindet, ist das gemeinsame Ziel, an Emscher und Lippe ökologisch, technisch und gestalterisch überzeugende Lösungen zu schaffen - in der Region und für die Region.

1. Challenge Introduction

Optimization and / or automation of anomaly analysis at discharge points of rainwater treatment plants

2. Challenge Details

As part of our activities at EGLV, we are also active in the field of rainwater treatment. Basically, precipitation results in a mixing of rainwater and wastewater, which together form a so-called "mixed water". If a certain limit value of the mixed water is exceeded, a so-called discharge situation arises, which leads to the mixed water being discharged into rainwater treatment plants via discharge pipes. The problem with this is that, in addition to rainwater and wastewater, the mixed water also contains other substances that can settle at the point of discharge of the process and even damage it. We are required to check the condition of the discharge points after each rainfall and make an assessment according to predefined criteria. At the moment, this is done manually by employees* driving to the corresponding discharge points after each precipitation situation. In order to speed up and automate this process of evaluation, we are looking for a solution from the field of image recognition and the associated AI Artificial Intelligence, which can recognize the inventory of discharge points based on images and evaluate them accordingly. The goal is to significantly reduce the number of deployments for manual condition detection and evaluation by staff*. As part of the challenge, we can provide the relevant image material and a catalog of criteria for condition assessment.

Lensing Media

Building a system to automatically generate messages in different domains from structured data.

Lensing Media is a family-run publishing company based in Dortmund, Germany. "Local networking" connects all Lensing Media companies. More than 3,000 employees work for our fourth-generation family business. Together, we publish the daily newspapers Ruhr Nachrichten, Dorstener Zeitung, Halterner Zeitung and Münsterland Zeitung, as well as market-leading advertising papers. We operate print shops, postal services and trade magazines, and are also increasingly focusing on our digital business.

1. Challenge Introduction

Building a system to automatically generate messages in different domains from structured data.

2. Challenge Details

The work of journalists has changed dramatically in recent years with the advent of digitization. Technological advances, the emergence of new forms of storytelling, the increased efficiency of automated workflows, and the availability of Big Data have given rise to a new form of journalism known as robotic journalism. Within this field, the term NLG (Natural Language Generation) refers to explicitly programmed systems that, for example, write news stories from structured data. Such systems are characterized by the fact that, once programmed, they no longer require human intervention. However, the development of such a system is tied to deep expertise in various areas such as machine learning and cloud computing, to name a few. At Lensing Media, our goal is to develop such a system to help our newsrooms automatically create news based on data from areas such as sports or finance. To develop a mature NLG system that can be successfully put into production, the following requirements must be met:

- Transparency: understanding how the texts are generated.
- Correctness: no misleading facts
- Modifiability and transferability: Transferability to other domains
- Natural fluency: the generated texts should be written as naturally as possible

Please note that the system must be developed in Python. Also, the underlying algorithms must be based on controllable end-to-end models such as gpt2. Template-based systems must not be used.

DOdata

Detection of the level of condensate separators in the gas network

DOdata sees itself as a DataHub and service provider for the future SmartCity Dortmund. We specifically combine sensor technology (Internet-of-Things), modern digital lifelines and intelligent data services in a platform approach. The result is solutions that improve the digital economy and life in our city. Translating today's requirements for modern business and life into digital solutions is both our challenge and passion.

1. Challenge Introduction

Capturing the level of a condensate collector in the gas network and sending the data via LoRaWAN.

2. Challenge Details

Condensate collectors are installed in a gas distribution network to collect accumulating liquids (e.g. water ingress and condensate from steam and other parts of the natural gas) within the distribution networks. Overflowing of the condensate collectors must be avoided urgently, otherwise the supply may fail. Since the levels of the condensate collectors cannot be determined at present, they are emptied regardless of their actual level. The cost of this is high because the collectors are buried underground. In order to avoid unnecessary effort and associated costs, as well as to increase the condition monitoring of the distribution network, we are looking for a sensor solution that detects the fill level of these collectors and sends the data via LoRaWAN. The challenge with this solution stems from the following:

1. the sensor must be robust enough to be installed underground and be durable and low maintenance. The data transmission equipment and power supply to the sensor should be accessible above ground.
2. the sensor must be able to measure the level through the material of the condensate collectors (usually steel, cast iron and polyethylene)
3. the detected levels should be sent to an existing IoT platform via the LoRaWAN transmission protocol
4. the sensors should be able to be installed in the existing network without major implementation effort (i.e., without civil engineering work)

DEW21

Development of a system for recording visitors in stores and data transmission via LoRaWAN

Dortmunder Energie- und Wasserversorgung GmbH (DEW21) was founded in 1995. As a modern and future-oriented municipal partner, DEW21 stands for deep and versatile expertise in the secure supply of energy and water, which is continuously adapted to the needs of customers and the market. On the way to becoming a modern life supply company, not only classic energy products but also the supply of digital solutions in an urban context (SmartCity) play a decisive role.

1. Challenge Introduction

Development of a system for recording visitors in stores and data transmission via LoRaWAN

2. Challenge Details

Not least because of the current situation, the registration of customers and visitors in stores is important. In addition to "Covid-19 purposes", it can also be used to derive information for marketing, staff deployment, energy use and the control of energy systems such as air conditioning. To meet all customer limits, recording must be accurate and operate in real time. Data must also be reported back to the store in real time - for example, via an app or a configurable "visitor traffic light." The data should also be available externally, for further real-time analytics or marketing, for example.

The challenge is to develop a system to capture visitors in the store and enable data transmission via LoRaWAN. In addition, the challenge can be extended to include a solution for measuring customer satisfaction and displaying real-time data. The transmission of the data via LoRaWAN creates flexibility for the location-independent use of the system.