Technical University of Denmark

Technical University of Denmark devises solutions for civic challenges

IBM Bluemix platform and big data capabilities reveal new insights during Big Data Hackathon

Overview

The need
Danish university students sought an opportunity to experiment with cloud technology and big data capabilities to develop solutions for a municipality's societal, economic and environmental challenges.

The solution
IBM Academic Initiative and University Relations teams and the Technical University of Denmark (DTU) collaborated to create a two-day Big Data Hackathon, which featured the IBM® Bluemix™ platform and services for solutions development.

The benefit
Within 48 hours, student-designed apps proposed new ways to improve energy utilization, bus routes and traffic patterns, primary school instruction and elderly care systems.

The Technical University of Denmark (DTU), located in Lyngby-Taarbæk Kommune in Sjælland, Denmark, is vigorously committed to promoting education and research within the technical and natural science fields. The university fosters innovation by encouraging its students, from undergraduate through doctoral studies, to integrate basic and applied research disciplines into projects within their fields of interest. As a result, students are dedicated to creating solutions that are useful to society and relevant to business while promoting sustainability.

Obtaining a fresh perspective

As a leading educational institution in the Nordic region, DTU continually strives to employ new technologies and educational opportunities for its students. When representatives from the IBM Academic Initiative and University Relations teams approached DTU with a concept, named the Big Data Hackathon, the institution eagerly collaborated. In fact, the university agreed to stage the event at the DTU Skylab, an innovation and entrepreneurship hub located on its campus.

IBM and the Technical University of Denmark (DTU) pressed students to formulate innovative solutions to civic challenges. "Integrating the hacking experience with new technologies and an understanding of infrastructure and society really brings about new solutions with big data," says Marianne Thellersen, executive vice president of innovation and entrepreneurship at DTU.

"It was a true joy to win after all the hard work. We see many possibilities in big data if you understand it properly and know its applications, it holds enormous value."

— Maxim Khomiakov, student,
   Technical University of Denmark (DTU)

The Big Data Hackathon started with 65 students from business and technical universities across Denmark parsed into multi-institution groups for greater diversity and idea exchange. Each group focused its research on a social, economic or environmental challenge that the municipality of Lyngby-Taarbæk Kommune faced. "It's always exciting when we let students loose and let them look at some of the things that we have available because they are filled with exciting ideas and business models that we have not seen in everyday life," says Sofia Osmani, mayor of the Lyngby-Taarbæk Kommune.

Collaborating to create new solutions

To facilitate their efforts, the students used the cloud-based IBM Bluemix development platform, storing the municipality's information within the IBM Cloudant™ database, as well as IBM DevOps tools available through the Bluemix platform. Over the course of two days, students from IT University of Copenhagen (ITU), Copenhagen University (KU), Aalborg University (AAU), Copenhagen Business School (CBS) and DTU worked around the clock to design and test solutions. The challenges the student groups tackled included:

- Optimizing energy utilization in Lyngby-Taarbæk municipality buildings
- Designing better bus routes to reduce carbon dioxide emissions
- Building a reactive system for traffic lights to promote "green wave" traffic patterns
- Renovating Lyngby-Taarbæk municipality buildings with a smart energy system based on optimum placement of solar cells
- Creating an elderly care system that best meets the needs of individual citizens
- Conducting an in-depth comparison of population groups for marketing purposes
- Using big data to help improve primary school instruction

At the end of the 48-hour challenge, a distinguished panel of judges made up of representatives from government, academia and the private sector reviewed and rated each project and selected the winning idea.

Solution Components

Software
- IBM® Cloudant®

Services
- IBM Academic Initiative
- IBM Bluemix™
- IBM DevOps

Delivering a win-win experience

Over the course of the two days, both university students and the Lyngby-Taarbæk Kommune benefited from IBM's cloud-based technology. The university students gained unbridled access to the plethora of DevOps, database and big data services and tools available through the Bluemix platform and its catalog of tools and services. For many, it represented an unprecedented opportunity to experiment and leverage the vast depth and breadth of IBM, third-party and open source cloud technologies. Students can build on their cloud-based Bluemix platform experience as they continue their studies and research.

The municipality of Lyngby-Taarbæk Kommune attained several cutting edge prototypes to help improve energy conservation, traffic planning and elder care services. The winning solution used big data to identify municipal buildings with significant energy leaks, providing Lyngby-Taarbæk with the opportunity to prioritize building renovations for improved energy conservation.
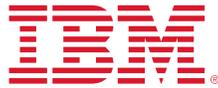
For more information

To learn more about the IBM Academic Initiative, IBM Bluemix platform or IBM Big Data & Analytics, please contact your IBM marketing representative or visit the following websites:
ibm.com/academicinitiative
ibm.com/bluemix
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