ANONYMOUS

United Kingdom

In its quest to develop and commercialize a unique service, a start-up company benefits from the provision of large-scale, high-performance computing facilities and data analysts at a UK government research council with support also provided by a large multinational technology corporation

Executive Summary

In 2015, a UK start-up company discovered an opportunity to assist civil engineering and construction companies in identifying likely areas in which archaeological sites may exist. This was achieved through the use of data analytics prior to any excavation works. The company worked closely with experts from STFC and IBM to create algorithms to demonstrate their concept using UK-sourced datasets.

INSPIRE
OPEN INNOVATION FOR SMEs

CASE N°: UKI11

SECTOR: SERVICES

TECH INTENSITY: HIGH-TECH

LIFE CYCLE STAGE: EARLY STAGE

INNOVATION VECTORS: SERVICE

OI PARTNERS: PSR, LARGE CORPORATION

KEYWORDS: Big data, data analytics, civil engineering, construction, archaeological investigation, predictive analysis, visualization

- BACKGROUND FRAMEWORK
- INNOVATION CHALLENGE & MARKET OPPORTUNITIES
- OI TRAJECTORY
- BUSINESS IMPACT
- LESSONS LEARNED

BACKGROUND

Geoff had previous work experience in exploiting data sets in a start-up company which was eventually acquired by Nokia. Geoff formed the newco in 2014 with a couple of other people with the aim of identifying data and predictive analytics projects in unexploited sectors. These sectors included maritime, construction and archaeology.

The future plans of the company are to acquire funding to enable the further development of its analytics software.

INNOVATION CHALLENGE & MARKET OPPORTUNITIES

The start-up company has ambitious ideas for solving problems currently not addressed quantitatively. The size of the challenge in developing solutions for these problems is great, as is access to the required high-performance computing facilities and data scientists to implement the solutions in software.

The company's managing director attended an STFC-hosted Open Innovation Day in Harwell. At the event the Director of the Department of Archaeology at University of York gave a talk in which she explained that the university curates the UK's archaeology high-level data. She further explained that the university wished to monetize the data they held and were looking for solutions. STFC ran a competition in conjunction with the Open Data Institute offering £50K of support from STFC and IBM with access to the Hartree Centre's supercomputer.

The SME undertook market research and submitted a proposal for the competition, which won a share of the support being offered. The proposal was primarily focused on the problem that needed to be solved rather than a strong market need, although the managing director expected that any solution would have commercial value. Prior work in this area had been predominately academia-based and only performed on a small scale; the use and benefit of big data and large-scale analytics had not been previously utilized.

OPEN INNOVATION TRAJECTORY

Concept development

The company's concept was to develop a proof of concept (PoC) analytical model that could predict the likelihood of unearthing archaeological artefacts. When construction companies unearth artefacts, the site needs to be inspected, excavated and the finds recorded. This leads to construction delays and increased costs and potentially the cancellation of the construction work. Therefore being able to predict areas in which artefacts are likely to be found enables the areas to be avoided or additional time factored into the construction process.

The development process, IPR and competition strategy

The company sourced high-level open data from a wide variety of sources including Defra, English Heritage, Scottish Natural Heritage, Ordnance Survey, and the Land Registry. The computing technology and software requirements were assessed for the processing and analysis of the data, which was the main focus of the project. The company identified the need to use IBM's Watson, which can understand questions posed about data and return specific answers about the data.

One of the challenges which arose during the project was that the volume of data available was too great to process effectively. There were in the region of 50 types of indicators of potential archaeological remains in the data sets obtained. Collaborating closely with staff at the University of York, the challenge was overcome by reducing the scope of the identifiers used from 50 to four while still getting good results.

Nine data scientists involved from STFC and IBM worked with the company to implement the analytical model using an agile development process. The company used a 3D geovisionary programme originally developed for the British Geological Survey to produce a 3D map of the UK. This made it possible to visualize archaeological remains in any location.

The IP required for the project was in the form of openly accessible data sets from a range of government agencies, universities and charities.

No competing products or services had been identified by the company before or during the project, and as such it was seen as unique.

The previous academic research in the area had been limited and not commercialized. The company perceived this had been due primarily to the size of the data processing challenge.

Commercialization and follow-up

Since completing the collaborative project, there has been interest from universities and public bodies for the company to develop further the outcome of the PoC project. One challenge in achieving this is that while obtaining commercial data sets is relatively straightforward through commercial agreements, it is more difficult when trying to reach agreements for low-level data sets from local authority rights holders. The managing director explains that local authority rights holders may be protective of their data because they are concerned about losing potential future revenue streams. The company believes it may need to lobby policy makers in order to obtain access to these low-level data sets.

A further challenge in rolling-out a product or service based on the model developed is funding. The company requires £500-750k to fund a couple of teams of algorithm and software developers to develop the PoC outcome further.

A leading university in the UK has stated to the company that it predicts that approximately £100 million of developer-funded archaeology would no longer be required if a tool based on the company's model was used.

The managing director is the only founder left in the company, after deciding the original team was not required. While based in an incubator, the company received public relations support from the incubator's PR staff. This allowed the company to benefit from news about their project being published in the technical press, including the New Scientist.

The PoC project has raised the profile of the company. The company is now looking at developing risk modelling tools for the commercial maritime shipping sector.

BUSINESS IMPACT

The main outcome from the PoC project is an analytics model. In undertaking the project, the company has gained new capabilities in data analytics, a new potential line of business and access to new technology. A further outcome of the project has been an improvement of the company's network of contacts, particularly in relation to technical computing assets in the UK.

Access to business training was also acquired as a result of the project, including: start-up, finance, cash-flow forecasting and marketing. The company's managing director is now a member of the Hartree Advisory Board and assists other start-ups to grow their business. The company has learnt how to find what facilities are available in the UK to help their business develop and facilitate access to potential partners and customers.

LESSONS LEARNED

The company's managing director's advice for other SMEs is to find organizations with time to listen to their concepts and provide enough resources internally to help them as a partner. It is also important to be able to demonstrate a concept in a form that is easily understood, i.e. something akin to presenting in a pitch-like environment. He stresses that it is important to get potential funders, such as venture capitalists, involved at an early stage in the project to encourage them to provide financial support for its future development.

To assist the company facilitate strategic collaborations with external parties, the company would benefit from:

- Support in the suggestion of, auditing, filtering and brokering of partnerships with third-parties;
- Access to further funding as the in-kind support for the project was very useful but further funding is required to develop a commercially suitable tool;
- Further flexibility in funding models beyond the typical match-funding type to help SMEs with great ideas to survive to the commercialization stage of a product or service.

This case demonstrates how a start-up company can benefit from the provision of large-scale, high-performance computing facilities and data analysts at a UK government research council with support also provided by a large multinational technology corporation.

This case also shows how new business opportunities may be brought to the attention of technology start-ups by academic organizations at open innovation events.

Main lessons learned:

1. PSRs can play an important role in identifying new market opportunities.
2. Access to open data can assist in the development of big data processing and data analytical models to create niche solutions for specific markets.
3. Careful financial planning for the further development and commercialization of a new solution is required during (and before the completion of) the proof of concept stage; this may require early discussions with potential funders, such as venture capitalists.
4. Licensing detailed low-level data for commercial purposes from local government authorities can be challenging from an organization's political standpoint and can create concerns among individual government staff as to the effect on their jobs.
5. The importance of finding the right partners who have the available time and resources to help develop a concept.
6. The importance of having something that is suitable to demonstrate and allows easy comprehension of the concept in order to attract further partners.
7. Not all large corporations are prepared to adopt and use disruptive concepts and solutions as potential users.