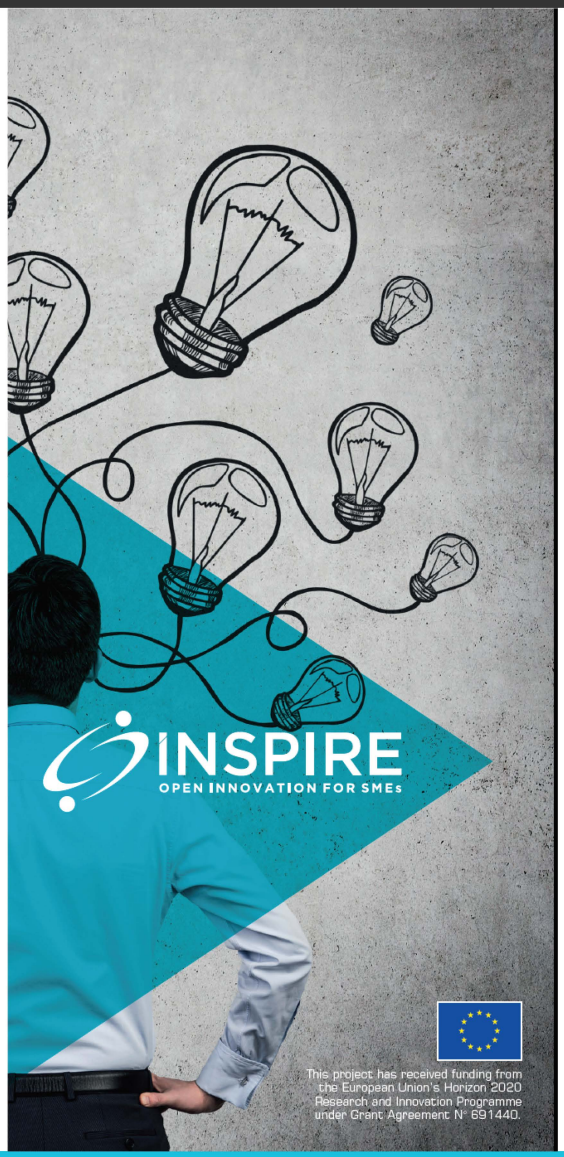

BEHAVIOURAL TRANSPORT PARTNERSHIP

Pseudonym

A Smart Cities project that involved two university-SME teams from two different countries failed to achieve its original ambitions but led to the development and testing of an innovative data collection tool for this established SME

Executive Summary

An SME active in the field of ICT applications design and development worked together on a bilateral project with its long-term strategic academic partner in the country and a team consisting of a university and an SME from another country. The purpose was to develop an innovative application targeting commuters, which would enable them to decide on the best route to their final destination in real time, as well as a data collection tool to research commuter behaviour. Trust and management issues with the bilateral partners caused this project to be a partial failure; however the national RTO-SME team managed to obtain an innovative and successful product as an outcome.

CASE N°: SE60

SECTOR: IT SERVICES

TECH INTENSITY: LOW-MEDIUM TECH

LIFE CYCLE STAGE: RENEWAL

INNOVATION VECTORS: PRODUCT

01 PARTNERS: PSR, OTHER SME

KEYWORDS: Commuter behaviour, JCT, Integrated application, data collection

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

BACKGROUND

The company has been active over the last 15 years in the area of planning, designing and promoting innovative ICT solutions by combining the most up-to-date features to add value for its customers in the fields of transport, shipping, energy, smart cities and the health sector. Furthermore, it provides support services for new product and service development -from the idea to market launch - in the field of user-centric information systems.

The company plans to continue innovating in its fields of excellence, while at the same time trying to expand its activities in the utilization of IoT technologies in the manufacturing industry.

INNOVATION CHALLENGE & MARKET OPPORTUNITIES

According to the interviewee, small companies need to innovate constantly to stay alive; his company is therefore always on the lookout to explore new projects which focus on new product and service development in key target sectors, such as the "Smart Cities" initiative. The main goals of the company's innovation initiatives are to maintain and grow their market share in existing markets and obtain access to new ones, while generating new revenue streams and developing/exploiting new knowledge and expertise in its target markets.

Strategic collaborations and open innovation are at the core of the company processes to achieve their goals. Over the years it has therefore established a broad network of strategic partners (mainly academia, institutional actors, local, national and regional authorities, as well as small and large companies) to design and implement projects of joint interest - using either their own/shared funds or other funding sources (EU, national funds, tenders and awards, etc.).

One of their key partners is a reputed national university team in the area of intelligent transport systems. The two teams already had a good track record of previous successful collaborations in innovative transport and joint maritime projects and were always on the lookout for new opportunities and areas where they could pool their expertise.

Urban social and economic development requires a continuous expansion of roads and infrastructure, which in turn stimulates more development, usually leading to near saturation conditions of the transport network, i.e. high levels of road congestion, increased costs, an increasing number of accidents and environmental pollution. Nevertheless, the transport sector needs to become more environmentally friendly, and sustainable transportation policies need to be promoted.

Against this background, researchers investigating commuter travel behaviour aim to understand better the inherent complexity of transport choices and their determinants and to provide more effective decision-support tools that analysts and policy makers can use to promote sustainable transportation. To this end, research on improved travel information, more efficient travel management systems and novel mobility concepts can offer substantial benefits in terms of cleaner, safer and more efficient transport.

In recent years data collection methods used for traffic and commuter monitoring have changed thanks to technology improvements. Moving from the traditional data collection methods via questionnaires, loop detectors, magnetic loop detectors, cameras and radars, research now focuses on data collection via mobile devices, RFID transponders, GPS floating devices, GPS enabled mobile phones, etc. The new data collection techniques and the new daily life patterns that have emerged have contributed to making commuter modelling a challenging task.

On the other hand, the convenience and improved features of smartphones have facilitated their use as an essential companion for commuters to address a variety of their needs; at the same time they can be used as a key tool for data collection, thereby supporting the analysis of more traditional and advanced traffic/commuter monitoring techniques.

OPEN INNOVATION TRAJECTORY

Concept development

An opportunity for a joint bilateral Smart Cities project (requiring the creation of a consortium from two different countries and co-funded via European, national and own funds) to address this market opportunity arose in 2013. Our SME, in collaboration with the national university team, formed a consortium with an international university, which had significant experience in

researching commuter behaviour, and a private SME working on developing complex mobility ICT systems.

The concept to be developed was an innovative service that would serve as a mobile application to allow city commuters to reach their destination using public and private transportation by the most efficient means. At the same time, another mobile application serving as a personal log would collect real-time location information through sensors made available through the commuters' mobile device. Following a user validation process this information would provide data to be used for identifying the travel behaviour of commuters, their needs and preferences, through the estimation of advanced behavioural models.

It was intended that the combination of these two applications would enable the utilization of an innovative data collection tool of commuter behaviour, providing the necessary input to customize the innovative service by offering each commuter personal real-time information to indicate the best mode of transport and route to get to their destination.

The development process, IPR and competition strategy

Before designing and implementing the concept, a thorough analysis of the state of the art was performed with the support of the whole consortium. A best practice analysis was undertaken to identify and understand commuters' needs in terms of a "personal transport guide" application as well as to gather and analyze data and lessons learnt from existing data collection methodologies. The analysis also reviewed work on modelling commuter behaviour and the impact of Intelligent Transportation Systems on travel-related decisions, including projects and studies related to already existing solutions.

Following this study, a survey of the expectations of external stakeholders (policy makers, transport operators, urban planners, decision makers, etc.) was undertaken to ensure that no requirements were missed during the development of the system. After analyzing this input, the next step was to plan the development process. The development activities were broken down into two parallel core tasks - one for each application. The commuter application, including the integration of the available sources monitoring the commuter's activity and the provision of personal guidance, was to be developed by the international university-SME team and the data collection application along with the commuter behaviour modelling tool was to be developed by the national university-SME team. Once the development was finalized, the two applications were to be integrated into one system, pilot tested in a suitable environment, fine-tuned and validated so as to reach the commercialization stage as one single service.

During the initial planning and the first implementation actions of the project, it became apparent that the project had two different pillars - one in each country. The monitoring of funding was overseen by two separate managing authorities, one in each country, creating conditions for confusion between the two university-SME teams with requirements, responsibilities and time schedules which were different from the ones jointly agreed during the approval stage of the project.

The partners attempted to develop a framework for preventing issues that could jeopardize the project as a whole by signing a consortium agreement and by including clear references and contributions to each outcome. The two teams agreed that the two pillars of the project should interact in such a manner that each pillar's outputs enhanced the results of the other, while ensuring that if one project pillar failed to deliver this should not cause the other project pillar to fail in delivering its outcomes.

However, given that the primary objective of each management team was to secure the (whole amount of) funding, delays in implementation and decision-making occurred due to the different requirements imposed on each project pillar. On several occasions the two pillars were implemented independently of each other, serving each pillar's management objectives so as to not compromise the funding and there was no sufficient leverage to align the activities of the two applications, leading to two separate streams of development.

Furthermore, the two teams did not feel confident enough to grant full access rights to their outputs to the other team without being assured that the other team would do the same. Although no one was willing to let the overall project fail, it was evident that the trust and commitment between the two teams (national/international) had been compromised. In the end a "low level of trust" dissolved to a quasi-zero level of trust.

Pre-existing know-how and the new IP to be developed where identified and set out in the consortium agreement, but since the trust between the two teams was already being questioned, it was agreed that any technological

development (algorithms, software, application, source code, product code) would belong to the party who developed it, and the other parties would not have any right to this outcome.

Currently, there are numerous applications providing guidance for commuters which have been developed by various individual developers, each covering a specific niche and/or using specific types of data. However, there is a lack of an application which makes good and smart use of numerous types of data sources. The system under development was designed to meet the unique requirements of handling huge amount of different types of traffic data delivered by several data providers, usually with no common standards.

Furthermore, data collection in the system was to be carried out by an innovative, non-intrusive, light-weight and easy-to-use application that would also have a feature of prompted-recall interaction for validation purposes. Using innovative methodologies to model commuters' behaviour, as well as their levels of satisfaction, the unified system would have used the findings to contribute to the customization and personalization of the real-time information made available to the commuters, so that they could use the best mode of transport and route to get to their destination.

Commercialization and follow-up

Although both applications were finished, neither of the two sides (the national and the international team) was willing to collaborate in order to proceed to their integration. IP issues were raised and as a result the integration of the two applications never took place. The national RTO-SME team (of which our SME was a member) decided to go on with testing and validating the data collection application as a stand-alone offering in a first phase. In a second phase, they added a transport guide offering with limited functionalities, with the support of the international team.

Since the commuters' personal guide part was missing, there was no motivation for actual commuters to use the app. To deal with this challenge, the team set up two competitions in order to develop two pilot applications. The aim of the first competition was to develop and implement a pilot application to identify and define the decision-making process behind the commuter's behaviour faced with various options (set by the application). The participants had to record and validate their daily travel patterns (through an interactive diary) for a week, allowing the development team to understand their preferences and behaviour. In addition, a questionnaire was designed and completed by the participants providing additional information about their daily activities, attitudes, socio-economic characteristics, etc. which were to be used for the development of commuter behavioural models.

In this context, it was essential for this two-fold-purpose research to take place concurrently, and - provided that the commuters were aware of the application and had the time to try -to use two tools as research vehicles: the questionnaire and application environment. Both tools focused on identifying possible changes in the commuter's behaviour. At the same time, the team was able to collect data on the actual implementation in terms of usability and usefulness, inter alia, on commuter behavioural models.

As an incentive to commuters, and in order to engage them throughout the duration of the pilot, a competition was set up with a prize for 1 winner (each daily participation was translated into 1 entry to a prize draw). As a result, the team managed to gather the necessary data. Furthermore, this methodology served as a comprehensive evaluation plan not only for those involved in the project but also for future users to evaluate the performance of the proposed application (in terms of fulfilling the project objectives, its usability, etc.).

The aim of the second competition was to serve as a control point for both the technical operation and the usability of the application with feedback from commuters who participated in a large event (departing from different locations but heading to the same destination point, at the same time on the same day).

A competition was set up with a prize for 1 winner and a free entrance ticket to a specific event (each daily participation was translated into 1 entry to a prize draw). The analysis of the commuters' travel patterns showed that the provision of appropriate and focused information before an event can contribute significantly to how the transportation network flows are managed. More investigation is needed in terms of understanding the factors affecting the emotional state of commuters and the effect that this may have on road safety issues.

These pilot phases validated the output of the data collection application and showed the relevance of the results as an input to an innovative personal guide. In this way the app can potentially contribute to the development and provision of proposals of increased relevance and interest to different users, i.e. which are suited to their needs.

With regard to IPR, given that the output is a computer software, the most common method is to apply for copyright of the source code. The

company-university team is considering two protection strategies: copyright and trademark registration (supported by an expert IP advisor) as well as to take know-how and confidential information protection measures (NDAs).

The strategy selected by the national team to attract potential customers (mainly RTOs and large companies) for the data collection application was to present the findings of the project to a wider community, interact with international key stakeholders in the fields of transport planning, commuter behaviour research and ICT and to have a targeted exchange of ideas with potential customers (RTOs, large companies, public institutions). In doing so they took into account the current experience and practice of data collection so that they could prove the competitive advantages of their tool

The application and web environment for the data collection process are already in place and the prototype has been tested. There are numerous fields in which the application could serve as a powerful tool for data collection (energy management awareness, medical/healthcare research, social research and media). Since the application was tested, evaluated and validated in a specific environment, its exploitation in a different environment would include investment in IP protection, new equipment and also technical support and customization.

The partners are exploring a "shared scenario", which involves a service provider who requires only a small investment to acquire or license the application and the technical equipment, with the university customizing the application and the SME assisting with the technical implementation. This scenario is currently considered by the team as the one with the highest potential impact on the business bottom-line, as it offers the chance to both public and private partners to engage in an OI activity to capitalize on the entrepreneurial opportunities created by this project.

BUSINESS IMPACT

The company was able to utilize its knowledge and expertise and create a new innovative product in collaboration with the national university. Although the initial objective of the project (integrated application for commuters and commuter behaviour research data collection) was not achieved, the final outcome (data collection tool as a stand-alone application) was developed, tested and validated and is ready to be used in other sectors too.

The company managed to advance its knowledge in managing large-scale and complex projects, to manage conflicts and mitigate against the loss of trust, as well as to find solutions to understand and meet the motivations and expectations of the product's end users.

LESSONS LEARNED

The most important outcome of this case is that even though the OI project with the international team failed, the SME – with the strong support of its trusted national research partner –was able to achieve an innovative and successful outcome (although different from the one initially planned).

Main lessons learned:

1. Trust is a key element of an OI project throughout the whole innovation journey (from the definition of the concept to market launch). In this case, trust was maintained throughout the project implementation with the SME's strategic partner (RTO) whereas conflicts with the rest of the team, which took place at an early stage of the process (development), could not be resolved.
2. Even though the initial target was not achieved, the company's joint efforts with the RTO led to a successful outcome.