Strategy as a Service

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A note on UTMC terminology

Whilst this paper is not about UTMC, it uses UTMC systems as a point of reference throughout. We have decided to use the term 'UTMC systems' to refer to software platforms which offer strategic monitoring and control of diverse roadside assets such as Dynniq's ImCity. It is common practice in the industry to refer to such a system as 'UTMC' or 'Common Database'. This has become complicated in recent years as not all the 'traditional' UTMC systems have remained strictly UTMC-compliant and new products have entered the market that utilise UTMC protocols in a limited way to communicate with a single asset type.

What are strategies and why do we need them?

Although there is no formal definition of the word 'strategy' in the UTMC framework, all the UTMC systems on the market today feature strategies in one form or another. They are typically an automated sequence of actions, often involving some conditional logic or arithmetic. The use cases addressed by strategies can be diverse but typically include:

- Automated setting of VMS with data from external sources for parking guidance or journey time advice
- Changing of signal plans and signage in response to an accident or planned event
- Clearance plans for major junction congestion
- Closure or restriction of weather-sensitive routes in response to meteorological data

The need for strategies is simple, it increases the effectiveness and efficiency of road network operations. Human operators can perform complex sequences of actions with a single click and many tasks can be wholly automated. This means a small team of operators can achieve far more in far less time, and allows authorities without human operators to realise the benefits of actively managing their network.

The UTMC common database is a natural environment in which to implement strategies as it provides data from, and control of, a large range of devices in a standardised format. However not all authorities have a UTMC system and it is unlikely that UTMC will ever be universally adopted. Therefore Dynniq has been exploring how to realise the benefits of strategies in alternative ways.

The Eboracum project

The Eboracum project run by City of York Council provided a testbed for a number of different technology solutions to improve traffic flow on the A59, an important route into the city centre for private vehicles and public transport. The emphasis of the project was on low-cost innovative solutions with minimal reliance on traditional infrastructure appropriate to smaller cities or towns who typically don't have control rooms or full-time operators.

Dynniq's brief was to explore how external data (in this case connected vehicle data provided by partner organisations) could be used in Dynniq's TMS1 to provide signal optimisation. The data was not sufficiently detailed to attempt stage-by-stage optimisation similar to SCOOT or MOVA, so instead we settled on a 'strategy' type approach whereby the journey time data was used to trigger signal plan changes. If York had a UTMC system, this type of strategy could have been configured and monitored by the UTMC team. However, York do not use UTMC and wanted a 'hands-off' solution that would run in the background providing benefit with a simple monitoring facility so staff could be confident that the solution was working.

For this proof-of-concept Dynniq provided a number of very lightweight software modules to retrieve the data, decide on the relevant plan to run and then request that plan from TMS. A web dashboard was provided to monitor the system status and the actions taken, shown in Figure 1.
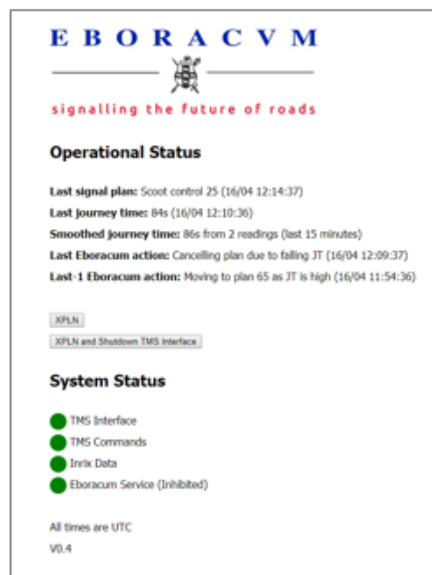

Figure 1. The Eboracum Control Panel

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1 TMS is Dynniq's UTC system

Towards Strategy as a Service

Eboracum proved that a simple low-maintenance strategy service can be of value to road authorities. Whilst technically there is no reason why an authority could not procure a UTMC system, with a very small scope and request the supplier or a third party to configure and monitor the required strategies, the legacy of UTMC makes this difficult; virtually all UTMC procurements to data have been major integration exercises with the aim of bringing all an authority's devices onto a single platform, often to be monitored from a control room. This history is reflected in the general perception of UTMC as well as the approach of procurement departments and even the pricing models of the available solutions. Whilst Dynniq remains committed to UTMC, we recognise that there is a need for a new offer with a different ethos: simple, outcome-based. We are calling this offer Strategy as a Service.

Delivering Strategy as a Service

Many of the tools required to deliver Strategy as a Service already existing as in the components of Dynniq's existing ImCity, TMS and other products. Our move towards hosted system means that we also have the tools required to run these systems as services. For example at a server level virtualisation allows a single physical server to run multiple virtual machines, significantly reducing the overhead of running a very small UTMC system. Similarly at an application level multi-tenancy allows customers to share a single software instance. This can be used to allow neighbouring authorities to share a system and access subsets of each other's' data. It can also be used to further reduce the overhead of UTMC to an almost negligible level by sharing the resource and license costs of individual software components across customers.

This 'downward scalability' of the solution also allows 'downward scalability' of the costs making strategy as a service accessible to authorities without the need to secure substantial additional capital from government – something which itself is a significant drain on authority resources.

As it is based on existing components and infrastructure, Strategy as a Service is available now!