



WMG Service Systems Group Case Study

Towards Effective Collaboration: The Service Transformation Toolkit

About WMG Service Systems Group

The Service Systems research group at WMG works in collaboration with large organisations such as GlaxoSmithKline, Rolls-Royce, BAE Systems, IBM, Ministry of Defence as well as with SMEs researching into value constellations, new business models and value-creating service systems of people, product, service and technology.

The group conducts research that is capable of solving real problems in practice (ie. how and what do do), while also understanding theoretical abstractions from research (ie. why) so that the knowledge results in high-level publications necessary for its transfer across sector and industry. This approach ensures that the knowledge we create is relevant, impactful and grounded in research.

In particular, we pursue the knowledge of service systems for value co-creation that is replicable, scalable and transferable so that we can address some of the most difficult challenges faced by businesses, markets and society.

About the EPSRC KT Box Programme

KT-Box is an innovative £2.2 million project funded by the Engineering and Physical Sciences Research Council (EPSRC). It involves six universities – Bath, Cambridge, Cranfield, Exeter, Nottingham, and Warwick – working together with industry partners BAE Systems, Bombardier, IBM and Rolls-Royce to develop practical tools and techniques to support organisations in the design, delivery and deployment of industrial services. The project is a spin-off from the EPSRC/BAE System-supported S4T research project.

About the Service Transformation Toolkit (STT)

The Service Transformation Toolkit (STT) aims to assist organisations in establishing *joint* capabilities to achieve combined equipment and service outcomes in partnership with their customers for outcome-based contracts.

This should lead to:

- High performance service and manufacturing value propositions
- Long-term viability and stability of contract delivery
- A well-designed and manageable process for change
- Reduced cost and risk of change

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In the new world of outcome-based contracts, the ability to deliver a promised outcome is bound up in the relationship between the parties involved collaborating to deliver that outcome. Given the emphasis on collaboration, maximising the performance of an outcome-based contract requires new tools to analyse the relationships and activities involved, identify strengths and weaknesses, and suggest actions accordingly. The EPSRC KT-Box programme has funded the creation of such a tool. Together, Professor Irene Ng from the Warwick Manufacturing Group of Warwick University and the MoD, with the assistance of BAE Systems and Rolls-Royce, have developed and tested the Service Transformation Tool (STT).

Traditional manufacturing business models are changing. Many manufacturers have transformed into complex service providers, supplying equipment on long term contracts, and undertaking to deliver outcomes – such as the availability of a piece of equipment over the lifetime of the contract. The successful outcome of this type of contract relies on effective collaboration to co-create value.



"So, for example, in the case of Rolls-Royce, if you were just providing the service of repairing an engine, you can just repair the engine. But if you enter into an outcome-based partnered contract, and only get paid when your customer gets those outcomes, clearly you are unable to do it alone," says Ng. "That level of collaboration is not easy. It requires a very close-knit relationship between the provider and customer."

Ng drew on Viable Systems theory to analyse the activities and relationships underpinning the delivery of an outcome. "Ultimately there must be an outcome, which comes from multiple providers. We wanted to look at who is providing what activities, and at the stability of the system, as well as to look at the service co-capability skills of both the provider firms and customer to achieve these outcomes. It's a different way of understanding service that is co-created, rather than passively provided. That is why the ability to map and understand the viable system is so important."

With the assistance of the KT Box programme, the STT emerged from the work package and value co-creation strands of the UK Government (EPSRC)

and BAE Systems-sponsored Support Service Solutions: Strategy and Transition (S4T) project. Ng's research identified seven different attributes of co-creation. "From those attributes, we then thought through how we make co-creation happen, what kinds of capabilities are required, what kinds of activities need to be in place," she says. "And, perhaps most importantly, what types of relationships are required, what social resources are needed, and how do you systematically analyse and create this core co-capability, instead of just being people-dependent. In short, we were interested to codify the practice so that it could be more systematically repeated and/or scaled".

STT in practice

The tool examines the collaborative delivery of a service outcome at three levels:

- each contract;
- each system-in-focus (i.e., groups of related contracts);
- and the entire customer-provider relationship.

Initially, there is an information capture element. This comprises a survey, and a series of questions to be asked relating to co-creation and variety across the five systems of the Viable Systems model, ranging from operations to governance.

There is also a high-level workshop mapping out the boundaries and scope of the viable system of collaboration. A written manual for consultants using the tool, also funded by KT-Box, details the workshop methods. The tool also captures all the value-creating activities of the individuals involved in the different systems and their relationships with one other.

Information from the capture element forms the input into a visualisation model, so the user can visualise their collaboration system. An algorithm based on the capture is used to create indices that flag up parts of the viable system where there are issues.

There is scoring system, based on what Ng calls homeostats; three major measures of the stability of the system. "The horizontal homeostat looks at stability in terms of your ability to adapt and respond to all the circumstances of the customer's environment, " says Ng. "The vertical homeostat is about stability in terms of managing the present and the future, what's happening now, versus what is expected to happen in the future, and the conflicts and tensions that involves. The third homeostat is a combination of the first and second; the total adaptability of the system, against the total conditions of the environment and the agility of the system to take on changes in the environment."

The user can see where there are gaps and deficiencies in the cooperative capabilities. That might relate to the social relationships in the system, for example. "Using the tool, you describe the AS IS situation," says Ng. " From analysing the captured data, using the tool, and from the way we have asked about your social resources, your relationships, your processes and practices, we are then able to map the root cause (of these gaps and efficiencies). That is produced in the final report, which tells you why you are having these problems, and where you need to go."



Appropriately for a tool that analyses collaborative capabilities, the STT was co-created with the MoD. Ng's MoD contact, a programme manager in the Combat Air Operating Centre, sponsored access to four different contracts across the Tornado and Typhoon fast jet fleets, facilitating access to people for interviewing purposes, as well helping in the system mapping. Both BAE Systems and Rolls-Royce who were involved in both platforms, also co-operated with the tool development process, which took Ng's original research ideas and concepts to create, modify and operationalise the tool.

"One reason the MoD really wanted this, was because it provided them with a tool to understand and compare co-capability across platforms and one partnered relationship against another, despite the equipment being different for these contracts," says Ng. "And it allowed them to understand their own performance as a co-creating customer, and how that impacted achievement of the outcome."

At the time the MoD programme manager involved was conducting a retrospective study of 'partnered' contracts involving both Rolls-Royce and BAE Systems on the Tornado and Typhoon aircraft.

"I hoped to shed some light on areas to improve extant contracts. I wanted to be able to do some comparisons between the Tornado and Typhoon contracts, to find out what was working well on each as an external view, and compare and contrast the way things were working with the different partners and, if necessary, hold a mirror up to a particular partner and say we could do this better, and here might be a better way of doing it," the programme manager says.

Initially, the tool was developed and improved while applying it to the Tornado contracts, says the MoD programme manager. It was then beta tested on the Typhoon contracts, while it was continually being refined.

Valuable insights

Applying the tool provided some valuable insights into both MoD contracts. "The tool looks at the viability of the management organisation's processes, and systems that have been set up: whether or not they are achieving the customer's needs," says the MoD programme manager. "It highlighted the nature of the processes and how they were working, and revealed some weaknesses in certain areas by reference to Stafford Beer's Viable System Model. The tool allows you to look at how the system is working at the moment, identify ways it needs to be tweaked in order to improve it, and then feed that back into any contract renegotiation."

Also, as the MoD manager points out, when an organisation is contracting for outcomes, relationships are an integral and key factor in contract performance. The contract does not work without good relationships. Yet analysing the efficacy of the contract can be difficult, precisely because people, relationships, and emotions are involved. It can be difficult to take a dispassionate and rational look at service delivery and see where certain areas are strong, or where they are weak and need improving.

"This tool looks at an organisation, but in non-threatening system modelling terms. You can ground the emotion that might be involved in those relationships, get away from the personalities, and start talking about it systematically, instead of putting it down to individuals in relationships or personalising it. We have used the tool in the pilot form. We have got results from it. Now we are working on optimising it so that can be used as a stand-alone tool and the 'partners' are trained to use it on themselves, because that is what the tool has to be to achieve continuous improvement," says the MoD manager.

"And I can see the broader utility. The tool is applicable more generally than just to the transformation of a manufacturing industry into a service industry. It is applicable to the whole concept of outcome-based contracting, and to achieving combined product and service outcomes rather than just separately focusing on product performance and service activities.

As Ng says: "When an organisation uses the STT properly, it helps the parties involved achieve their contracted outcomes consistently, in a stable manner, and in a manner that is effective and efficient – so that the system of activities could be replicable as a capability, customer outcomes are consistently achieved, and the outcome-based contract could remain economically viable for both sides.