Stakeholders will have high expectations of the ability of the Single Window to remove many of the irritants faced by industry in import and export procedures. Service and interaction design come in handy. Designers must think through the problems and come up with solutions well before the first line of code is written. Policies and procedures must support design concepts that minimize interaction between authorities and traders, who should be able to use a variety of self-service options.
1. Introduction

Regulatory authorities are service organizations, and the Single Window environment is the medium through which services are delivered. Part I of Volume 1 discussed the Single Window environment as a collection of services produced in the course of interaction between trade and cross-border regulatory agencies. Such services are aimed at simplifying trade’s efforts in meeting the requirements of cross-border regulation. If performed efficiently and effectively, these services help preserve value in a supply chain. Various technological and human resources, including skill, ingenuity and experience, are brought to bear by the participants in these service operations in pursuit of value preservation.

Services are delivered through access channels. During delivery of a service, the trader (and his IT systems) and the CBRA personnel (and their IT systems) participate in the creation of the service. The Single Window facilities are at the centre of this complex process. Like any system, a Single Window also involves a complex combination of people, processes and technology. Any improvement in these systems must necessarily include all three components and must begin at the design stage.

In Part I of Volume 1, we briefly examined the links between different aspects of service design and noted that interaction design was an important part of it. Interaction design requires a combination of inputs:

- Business process models
- Technology architecture
- Functional and non-functional specifications
- Physical evidence

Any design process must consider the question of business value. Features of a Single Window solution that add to costs without adding value need to be eliminated.

1.1 ‘Business Value’ in Border Services

Before delving into the question of designing services, it is perhaps necessary to understand the nature of ‘business value’ in a Single Window environment. Cross-border regulatory agencies tend to define the business value of their services purely in macroeconomic terms. Protection of society, maintaining the streams of government revenue, and protecting national borders from danger are how Customs and its partner agencies often describe the contribution to the economy and society. At that level, it is hard to visualize ‘business value’ for the individual economic operator. For the firm engaged in cross-border trade, regulatory services are frequently viewed as processes to be endured and as necessary operational expenses. Regulatory authorities are not given to pleasing their clients, and economic operators must not be found to be on the wrong side of the law. Enforcement of regulation is, however, a limited view of regulatory services.

Cross-border regulatory services help preserve value for economic operators in different ways. Cross-border regulation, which is often seen as necessary for the greater good of society and the
economy, is now increasingly aimed at benefiting the individual consumer of goods traded across borders. In any case, these regulations cannot be wished away. Regulatory services, if efficiently performed, can improve the predictability of delivery times and reduce logistics costs. Variability in delivery times and costs lead to increases in operating expenses and therefore diminishes economic value for the consumer.

The costs of non-compliance with regulations relating to duties and taxes are evident. Non-compliance causes avoidable financial strain on the firm by way of fines, penalties and legal expenses, to name a few. Non-compliance may be due to ignorance of statutory provisions, or plain negligence on the part of the economic operator. The financial consequences of non-compliance involve inevitable loss of value to the firm, and consequently to its customers. While most cross-border regulation is aimed at protecting the health and well-being of society as whole, it is increasingly being aimed at product safety and quality – attributes that add tremendously to customer value. In that sense, the regulatory checks provided in the international supply chain give assurance of customer value. Apart from financial losses, non-compliance may also result in loss of reputation to the firm, with even greater economic consequences. This aspect makes cross-border regulatory services not just cost centres, but also strategic players in the value chain, helping to ensure and preserve customer value.

In conclusion, the value of cross-border regulatory services is achieved by preventing unnecessary consumption of resources, or unwanted change or damage to the normal flow of cargo. Each useful and accurate piece of information that a web portal provides, each feature that reduces effort and cost in terms of data entry, and each interaction that leads to predictability, adds to value for participants.

2. Designing Interactions

Bringing services ‘under one roof’ involves a collaborative effort on the part all CBRAs in redesigning interactions between the trader and regulatory agencies. This restructuring of interactions must be carried out from the trader’s point of view. Interactions can happen through multiple access channels, but can broadly be divided into two groups – virtual and physical. Online submission of information and documentation is in the virtual domain, whilst face-to-face interaction between the trader and officer falls into the physical domain.

The convenience and accessibility of the location of service outlets, layout, service counters, waiting times in queues, dead time between operations, and physical conditions at the service desk, are all important questions for interaction design. However, even more important are certain ‘soft’ issues which can only be addressed at the design stage. If a specific interaction between the officer and the trader involves multiple and highly subjective outcomes, then there is potential for user dissatisfaction. ‘Built-in’ complexity and variability in interactions reduce the level of predictability and increase the chances of manipulative or corrupt behaviour. In such types of communication, the trader will get the feeling of not being in control of the transaction. The effort, therefore, should be to identify such situations at the outset and to eliminate them as far as possible. The following Section deals with questions of interaction design.
2.1 Classifying Interactions:

The ultimate success of a project will be assessed through feedback received from stakeholders, and based on the achievement of predefined service metrics. The interaction of the trader with the IT systems interface is one aspect of the service experience. The other type of interaction is with personnel in front-offices of CBRAs. Together, these interactions will determine the overall character of stakeholder feedback. Therefore, it makes sense to pay attention to this aspect at the design stage.

Understanding Service Interactions:

The following is a simple list of interactions that take place in a cross-border regulatory system.

- Broker’s back-office enters details of the invoice into the online form for filing declarations;
- Customs broker’s employee approaches warehouse to seek release and registers his statement;
- Truck driver crosses no-man’s-land to approach border post to apply for release;
- Transporter enters the terminal gate to report goods for export;
- Exporter checks web portal on the status of goods;
- Importer waits with his documents for examination by Customs official;
- Manufacturer rings the veterinary officer to arrange an appointment for the certification of live animals.

Is there a way of classifying these different types of interaction? The discipline of service management provides some answers. Project managers and designers of Single Window services need to focus on these processes at the design stage.

Interactions occur in space and time, and for cross border regulatory services; time is the biggest variable and has to be counted as money. The discipline of interaction design introduces time and ‘ease of use’ as two important variables in user experience, and seeks constant improvements in both. Overall user experience is the sum total of the entire process, and includes several tangible and intangible aspects of design. Figure 1 below illustrates the context of interactions.

Fundamental to interaction design are the business process models. These define the ‘state’ of the process which outlines the settings, and provide the platform for determining the functional specifications. The non-functional specifications can also be provided as part of the requirements. In Figure 1, the human factors of design can easily be identified. The factor ‘variability of output’ refers to the various possible outcomes of interaction. The higher the variability of output, the greater the challenge to management, and the greater the chance of user dissatisfaction and loss of predictability. This is a point of great interest to executive management. Reducing the complexity of tasks involving user interaction is an essential aspect. Complexity can be reduced by defining scenarios and establishing routines. Intensive user training can improve the competence of individual users in dealing both with physical and virtual interactions.
2.2 Standardizing Cross-agency Controls

Different cross-border regulatory agencies define controls differently. Each organization has priorities based on its perception of risk, and risk-analysis and mitigation practices. The benefits of a Single Window environment cannot be fully realized until controls by different agencies are coordinated. Co-ordination of checks is a process of co-determination of priorities. This can be done through integrated risk-assessment systems which process harmonized risk rules drawn from different agencies and provide prioritized instructions for control. Alternatively, each agency assesses risk separately, and priority and choice of monitoring methods are determined through co-ordination. In either case, there is potential for delay in the selection of control methods and priorities for action. This can pose serious problems for the trader, who will stay in ‘no-man’s-land’ until regulatory agencies decide on a course of action.

In addition to agency priority, there is also the question of application of standardized controls. The Guidelines to Chapter 6 (Section 7) of the Revised Kyoto Convention (World Customs Organization 1999) provide a detailed explanation of different types of Customs controls. The performance of documentary, physical, and non-intrusive controls, and methods of drawing samples, are activities
that can be standardized to a fair degree. Nuances of control depend on skill and knowledge about modi operandi. Regardless of the situation, for every context of control, performance and output should be standardized as far as possible. Variability, vagueness and uncertainty in the performance of control activity can lead to adverse outcomes for trade, as well as for regulatory agencies.

2.3 Designing for Co-creation and Self-service

Each party in the international supply chain can help another in achieving value. The Customs broker will save time if the supplier can reliably provide the correct HS classification and other regulatory attributes of the traded product. The Customs broker is then able to prepare accurate goods declarations. Regulatory authorities will consider these to be sound if they come from a reliable broker. Over time, there will be reduced levels of examination for transactions of this kind. The broker benefits because fewer resources are used to support the control of goods, and may be deployed for other tasks. The regulatory authorities gain too as they can use fewer resources in verifying such declarations. Both parties can benefit even more by directing resources to areas of non-compliance, creating a virtuous cycle of value preservation.

Each party has a perspective on what helps protect value in the course of regulatory clearance. The gains are often complex and subjective, and are mediated by knowledge-intensive processes. These depend on whether the parties have an understanding of the application of laws, regulations and technology. In the supply chain, each party has to ensure that exchanges of information are correct, accurate and timely. Every exchange that has these attributes saves money for everyone down the line. The processes also include bartering for value – the more compliant an economic operator, the less ‘trouble’ there will be from regulatory authorities. The more quickly the forwarder provides information, the faster the declaration can be filed, and the greater the chances that the haulier will receive the delivery of goods at the appointed time. This bartering often takes a formal shape in the form of a service agreement among the parties involved. Even regulatory authorities have formally established programmes that certify efficient and compliant traders as ‘authorized’ economic operators – an arrangement which guarantees value preservation. Single Window services play a critical role as they provide the essential platform for all these exchanges.

2.4 Collaborative Processes

Cross-border regulatory services involve the collaborative sharing of information. The supply chain process requires the exchange of information between the participants through business-to-business collaboration platforms. Such platforms help co-produce information needed by members along the supply chain. There is also a role for CBRA systems in the Single Window environment. Regulatory information and controls are interspersed in the regular flow of cargo across borders.

Time release studies (TRSs) have revealed that the preparation of the goods declaration consumes the most time, effort and cost for traders. CBRA systems treat the processes involved in gathering data to meet exacting regulatory requirements as part of the trader’s responsibility, and are content to defend the time taken to prepare declarations and to examine goods. It is, however, not well understood that CBRA systems can influence the process of making regulatory declarations. Information which only CBRA systems can provide (e.g. in respect of different commodities, the data validation process for making complete and accurate declarations, guidance on data quality and procedures) is extremely relevant to the whole process. CBRA systems can provide interactive facilities that help prepare goods declarations.
Providing such services does not in any way limit CBRA capacity to hold traders accountable for their data submissions.

Figure 2 below illustrates a hypothetical process involving a facility that permits collaboration between the trader, carrier, broker and CBRA. The data required for a declaration is gradually built up by the broker as he gets access to different data sets from the trader and the transporter. Information is allowed to be accessed collaboratively, and with the progression of the ‘state’ of the transaction, incremental data is generated. Each piece of data adds to the information that CBRAs seek to collect. In a system that promotes real-time collaboration, there is access to relevant information by all parties concerned and thus no time is lost between the business event and regulatory reporting. The use of web services technology allows the realization of these exchange scenarios in straightforward and affordable procedures.

This contrasts with paper or email-based systems where the broker receives faxes in which the information has to be interpreted and entered into computers. Such processes are time-consuming, error-inducing and non-transparent. The design of the solution for a Single Window environment should not only encourage it, but also actively provide for it.

![Figure 2: State transition and information access rights in a Single Window environment.](image-url)

### 2.5 Progressive Build-up of Data

One of the principles of system design is to provide for a gradual build-up of data so that the burden of document preparation is minimized. The order of information creation is depicted in the following Figure.
Figure 3: Government cross-border regulatory message (GOVCBR). The structure illustrates the logical order for the creation of supply chain data.

It is possible, by following this logical order of information creation in trade and transport, to develop small messages that incrementally provide regulatory information to the government. That is the essence of Version 3.0 of the Government Cross-border Regulatory Message (‘GOVCBR’). GOVCBR is a United Nations standard message which was established as part of the WCO Data Model project.

2.6 WCO UCR: The Electronic Access Key

Information about a cross-border transaction grows with each trade and transportation event. For efficient operations, it is necessary to re-use information that is already stored in the computer systems of traders, transporters and community systems. Easy access to information depends on access keys. Document references are a good way to obtain information – but to move away from documents and access meaningful units of information directly, it is necessary to use other identifiers, such as the UCR, product identifiers, package identifiers, etc.

The following figure highlights the importance of the UCR as an access key. Once a UCR is generated in the early stages of the transaction, it remains a very stable access key throughout the transaction.
2.7 Designing for Transparency

The design of information systems can impart transparency by providing timely information to trade players. Transparency is the basis for accountability. The design concepts that give transparency for trade are discussed below.

Publication of Regulatory Information

Most services listed in Part II relate to publication of information. Most information should be presented and published in such a way as to be easily used by automated systems. Tariff and non-tariff requirements for goods need to be submitted unambiguously. Information involving ambiguity or fine print, or requiring a high degree of interpretation, promotes discretion and should be avoided as far as possible. If the user can understand where to find information and can access the appropriate resources for help, this also promotes user confidence.

Wizard-based Interaction

Wizards are interactive tools on the user’s screen that guide the user through a procedure from start to finish. Providing clear information about the current position of the user in the chosen procedure, wizards can also provide an estimate of the time required for completing the process.
/promote transparency. For the trader, they develop a sense of being ‘in control’ of the transaction. This is especially important since, in a Single Window environment, routing of some transactions will involve workflows and movements of control procedures between agencies. Due to differences in regulation, separate procedure wizards may be necessary for some commodity groups.

**Access to Decisions and Timestamps**

Transparency is improved by providing users with access to regulatory decisions and timestamps of events. Capturing timestamps not only helps with the execution of time release studies (TRSs), it also provides a way of assessing the promptness of actions by officials. As far as possible, and as generally required by regulations, all decisions have to be reasoned and fair. Standard 10.3 in the General Annex to the Revised Kyoto Convention (World Customs Organization 1999) requires that the affected person be given, upon request, the reasons for decisions or omissions by Customs. Providing reasoned decisions adds to transparency and fairness.

**2.8 Designing for Accountability**

In a Single Window environment, accountability primarily concerns ‘after-the-fact’ verification of regulatory authorizations given by the system about import, export and transit. It also concerns the role and contribution of individuals and systems to service levels (or the lack of such contribution), and the information trail that reveals points of delay and inefficiency. The accountability mechanisms rely on the audit of information stored in the databases of IT systems.

The ability of the system to call to question individuals for their actions is dependent on its trustworthiness. A system will be considered ‘trusted’ if it has the necessary security controls, and the characteristic of being ‘trusted’ needs to be certified. This goes for any system, and not just for those in the Single Window environment.

In the EDI, auditing mechanisms were developed and incorporated as part of the protocol in the interchange agreement. Since the Single Window environment also involves extensive interaction between the IT systems controlled and operated by partner CBRAs, similar mechanisms are in place. To summarize, designing for accountability includes the following considerations:

- ✔ What would be the agreed audit protocols?
- ✔ How do we define the power of auditors?
- ✔ What is the responsibility of the officers (defined during the design of interactions)?
- ✔ What requirements do these aspects of audit place on communication and computing resources?

There are trade-offs involved in producing answers to these questions, and these are management decisions. It is a good idea to include the formal audit structures at the design stage and to obtain endorsement of the audit mechanism from government and professional information systems auditors. At the design stage, technical input from the highest-level national statutory audit body is useful and may even be relevant.

The advantages of a Single Window environment include removal of paper-based processes, reduction in human interventions, and no rekeying of data for filing declarations. Paperless
processing does not imply the absence of a paper trail or loss of auditability. Digital data helps Customs to link up transactional information for post-audit purposes.

Through efficient design, management should be able not only to detect fraud faster, but also to prevent defects and losses, through better internal controls. The Single Window environment provides the ability to substitute manual controls for automated ones, but it is management’s responsibility to ensure that these controls are built in at the design stage, and implemented by the vendors. Rigorous testing of these controls must also be performed, and software should be certified by qualified professionals.

### 3. Designing for Interoperability

Investment in information infrastructure yields ample returns. Therefore, executive management must make sure that it follows mature processes that make information systems interoperable, reusable and scalable. The question of reusability and scalability is also discussed in detail in Part VII of Volume 2 of this Compendium.

Interoperability is broadly categorized as platform, data and process interoperability, and can be invoked by the participating companies on an ad-hoc basis to support the regular flow of business (Ulankiewicz, et al. 2010). Much like *utilities* that can be tapped and used quickly, interoperable systems should not require extensive customization and integration effort. The ‘interoperability vision’ is realized when the interaction between systems becomes cheap, fast and reliable. Interoperability lets software applications running on different technology platforms communicate with each other using various communication protocols. The lack of ability to share information between computer systems is often a question of cost.

The Single Window concept is premised on efficient data exchange between business and government on the one hand, and between CBRAs on the other. For business data to be transferred between two CBRAs, their systems should interoperate. Information technology vendors often make exaggerated claims (Glushko and McGrath, 2008) about the capability of modern technology tools to ‘seamlessly connect’ with each other. Seamless connectivity is easier said than done. Even though each new device and item of technology has brought about improvements in productivity, in terms of the processes for interconnecting between information systems, there are clearly many problems which need to be addressed.

CBRAs operate different IT systems that may have been built over several years. Technological platforms, application software, business processes and business semantics may vary across systems. The more mature the individual IT systems, the more difficult it is for them to interoperate.

The information models of CBRAs must match with each other, and in sophisticated IT systems, models are already frozen at the time of commissioning, with little that can be done to undo them. In other words, the earlier the systems are developed, the more difficult it becomes in future for systems to work with each other.

Regardless of whether we are dealing with legacy systems or new systems for development, the most challenging type of interoperability is semantic interoperability, which is at the core of a Single Window environment. Even though data collected by CBRAs is roughly about the products,
locations, facilities, means of transport, etc., semantic differences will prevent one CBRA from using the data collected by another. Bridging these differences is essential for promoting collaboration. Better interaction can be addressed through the methodology provided in Part V of Volume 2 (‘Data Harmonization’).

The process of arriving at interoperable data sets (semantic assets) is a complex one and requires sustained support from executive managers, who should provide an opportunity for collaboration, as well as platforms to share data standards through a repository. Participants in the Single Window environment should be able to access the repository and produce conformant implementation.

### 3.1 WCO Data Model

The WCO Data Model is defined as “a maximum set of carefully combined and harmonized data requirements derived from cross-border regulation. These requirements are mutually supportive and will be updated on a regular basis to meet the procedural and legal needs of cross-border regulatory agencies such as Customs, controlling export, import and transit transactions.”

The Data Model is based on the Revised Kyoto Convention, which requires Customs administrations to request minimal data to ensure compliance with Customs laws. Customs authorities will therefore, at most, need the data elements listed for each Customs procedure in the respective data sets. These self-imposed limits discourage future increases in data requirements.

Version 3.0 of the WCO Data Model captures the essential patterns of a cross-border regulatory declaration. To avoid repetitive submission of data, it is necessary to have a harmonized data set. The process of arriving at a harmonized national data set is explained in Part V of Volume 2 (‘Data Harmonization’). Using the simple solutions provided by the WCO Data Model, it is possible to put together a common declaration format for all regulatory goods.

Besides making possible a simple regulatory declaration, the WCO Data Model encourages the reuse of information. The Data Model also provides common patterns of reuse. Figure 5 below illustrates the possibilities of reuse within the WCO Data Model, and demonstrates that it provides a simple solution to a complex design problem.

The discipline of using the WCO Data Model ensures that any new data requirement for cross-border regulatory procedures follows a thorough analysis of needs and decisions, based on international standards. It should also consider trade’s ability to provide the information in the ordinary course of its business.
4. Assurance Process in Service Design

This Section addresses the processes available to management for obtaining assurances that the envisaged project meets user expectations. The purpose is to arrive at documentation that holds the delivery team responsible for the outcome. There are several types of documents that executive management must require from project teams. A few are listed below, explaining the qualitative and quantitative aspects of design.

Figure 5: Structure of an integrated Single Window goods declaration.
4.1 Business Use Cases and User Stories

Business processes can be documented in many ways and can be studied at different levels of abstraction. Business process documentation enables the analysis of process steps regarding business value. It also identifies key points of responsibility in the entire process flow. The goal is to detect and eliminate process steps that do not add business value, and to locate main process points that are vital to performance.

Use cases are increasingly being utilized to capture and communicate detailed, functional requirements from the business managers to the information technology solution providers. Business process models can be drawn at different levels of abstraction. For executive management, business use cases are of value as they describe the processes and the expectations of stakeholders at a very high level. Use cases need to include functional and non-functional requirements. Functional requirements are easy to understand and are rooted in business logic and government regulations. However, executive management should insist on the clear and thorough specification of non-functional requirements, such as usability, performance, security and adaptability, along with clear metrics for acceptance. Non-functional requirements are perhaps the most challenging area in requirements management.

Business use cases should be illustrated pictorially, using simple diagrams which explain the exchange of information and the flow of decisions. Such descriptions come in handy for stakeholder consultation. The functional and non-functional requirements taken together provide a sound basis for service level specifications. Good business use cases are also the basis for solution acceptance procedures.

Distinct from use cases are ‘user stories’: narratives which, in everyday business language, capture in a few sentences what the user wants to achieve. Although this style of capturing requirements is preferred in particular types of software development methodologies (e.g. ‘Agile’ development), user stories can still be used as the basis for eliciting requirements in an iterative fashion.

User story example 1:
“I <as a truck driver> cross no-man’s-land, park my truck and swipe my card in the machine. Upon swiping the card, the machine displays my truck number and provides a sticker with a barcode. I stick the label in the designated spot on my import report document and wait for my turn. I enter the number on the touch-screen kiosk; it displays the expected time when my turn will come. After 5 minutes, the electronic display board announces my reference number and directs me to approach counter number 6. My documents are stamped, and I proceed with my truck to the exit gate.”

This user story can be expanded, and people can work on different stories to achieve different solutions for the same scenario, with examples. User stories can help build up management’s vision of the use of technology. Alternative user stories can be discussed iteratively, and each interaction can be checked for improvements and opportunities for using self-service or technology-based interactions.

User story example 2:
I <as a truck driver> cross no-man’s-land and reach a point where I am greeted by a border guard, who takes my document and scans the 2D barcode against it. He checks my passport and driving licence and advises me to proceed to the baggage check. I remove my baggage from the baggage
hold of the truck and walk into the room with the metal detector. In the meantime, the vehicle and the container on the trailer are scanned using a repositionable gamma-ray scanner. After passport control, I take the truck to the exit gate, where I again present the 2D barcode at the scanning point, and the gate opens automatically, indicating the release of cargo. I wave and smile at the border guard before proceeding.

4.2 Service Blueprinting

Service blueprinting looks at a business process as a series of interactions, and holds that positive experiences of the interaction will improve the overall quality of provided services. Service blueprinting refers to a design tool based on process flow diagrams, in which front and back-office operations, and all intermediate layers, are described. Each man-machine and face-to-face interaction is described as it happens, in a sequence. For each communication, the standard execution time, expected wait time, and points of failure are captured. Alongside this, the risks of failure or deviation are identified. Possible exceptional situations and failure points are also documented, along with mitigation and service recovery strategies.

Figure 6: Service blueprinting of cargo examination process.

Models are tools for communication, and a ‘service blueprint’ is a service model. The above figure is an example of the service blueprinting that defines the ‘touch points’ for users. Managers can, at the design stage, easily gain an understanding of the ‘to-be’ picture, which they always use at the time of acceptance testing.
4.3 Service Level Specification

In the design of Single Window services, service level specifications must be recorded to produce a shared understanding of the availability of service (working hours of the Window), performance, and quality in terms of minimum guarantees regarding the time taken to perform each business step. Service level specifications in business terms can become the basis for the specification of the underlying IT services. The latter are defined more in terms of uptime guarantees, mean time between failures (MTBF), and mean time to repair (MTTR) in the case of breakdown. Service level specifications can become part of service level agreements, which lie at the heart of contracted performance.

Cross-Agency Service Level Specification

If service level specifications are defined in terms of individual CBRA s for the whole transaction, then the purpose of the Single Window approach would be defeated. One of the key agreements that CBRA s must reach among themselves is the service levels they intend to provide collectively. It follows from this that there will be a standard approach to all service design, starting from business process design, going through to data modelling, interaction design, physical infrastructure and the service desk.

5. Conclusion

This Part describes the process of developing Single Window services. The taxonomy of services helps identify and prioritize the sequence of deployment. Handling Single Window projects in terms of business services helps executive managers to track the business value as the rollout of projects happens. When success criteria for projects are defined regarding delivery of business services, it allows management to estimate the cost of services accurately and to produce benchmarks. The services paradigm not only helps provide useful frameworks for solution architects (service-oriented architecture), it also opens up possibilities for using the discipline of interaction design, which can make all the difference in user satisfaction, both for the traders and for government officers.

Service design covers online communication between the trader and the web portals, using a variety of end-user devices and access channels, and includes the choreography of face-to-face interactions at service counters. The outcome of the design process will impact not only business processes, workflows and electronic form design, but will also significantly influence the project concept. For instance, the manner in which information is submitted to a Single Window is also a question of interaction design, where traders who are in possession of incremental information can seamlessly provide it, and that submission will reflect a natural progression of ‘state’ in the trade or transport process. Gradual, stagewise submission of data results in a corresponding incremental change in the regulatory status of goods/cargo. Undoubtedly, the WCO Data Model is a highly useful instrument to support this concept.

When services are ultimately rolled out, IT-enabled service management can be employed to track project performance efficiently, completing the full cycle for a Single Window service, starting at the drawing board and going all the way up to production and realization of business value.