Urban Logistics and Transportation - Defining a B2B Concept of Operations for Urban Construction Consolidation Centres

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Abstract

The challenges facing the UK construction industry reflect many inefficiencies in current practice: 60% of planned vehicle deliveries do not arrive on time. The Urban Construction Consolidation Centre (UCCC) concept aims to promote a more efficient flow of construction materials through the supply chain, reducing vehicle deliveries and the impact of urban congestion. New B2B relationships have emerged and multi-partner service model concepts need to be developed, in order to aid partners understand roles and inter-relationships in service delivery. A B2B Concept of Operations (ConOps) to define the key elements, operating philosophy and design and operation of UCCCs is presented.

Key words (3-5): ConOps, Consolidation, Construction, B2B

1: INTRODUCTION

The challenges facing the UK construction industry reflect many inefficiencies in current practice: 60% of planned vehicle deliveries do not arrive on time, 20% of all UK waste comes from construction (Environment Agency , Nov 2009), 15% over-ordering of materials (Transport for London - London CCC Interim Report May 2007) and nearly one hour lost productivity per person per day on every construction project due to materials delay (BSRIA report, Feb 2008). In London/Heathrow the lack of space, operational necessity and mandated need to reduce local site congestion have been the key drivers for change. However, for projects outside London, inefficiencies in supply to sites are masked (lower urban densities, use of local roads as overspill) but continue to contribute to significant road congestion.

This research (sponsored by the UK Technology Strategy Board, as part of the 'Informed Logistics' programme) pilots and examines the 'Urban Construction Consolidation Centre (UCCC) concept. The Construction Consolidation Centre (CCC) solution aims to promote the efficient flow of construction materials through the supply chain to the work face on-site, providing 'just-in-sequence' consolidated supplies to multiple construction sites, reducing vehicle deliveries and reducing the impact of congestion, pollution, and waste. Construction material, less bulk items such as aggregates, would be delivered to the UCCC, where they are formed into work packs, defined by the various contractors, and delivered to the work face, using 'just-in-time' criteria. In the scheduling of multiple part loads, unnecessary packaging is removed for re-use or re-cycling. Site based material distribution teams extract all unused material, manage and reduce waste, and maximise re-use. In the UK, construction consolidation has only been used in London due to the operational necessity (space, vehicle movement reduction and control), and which are largely project specific and temporary in nature. Where construction has not had those imperatives, contractors have chosen to revert to traditional, less efficient supply chain models. The UCCC is innovative in the application of existing consolidation technologies to multiple projects within the wider context of Local Authority construction, providing community and commercial benefits, promoting greater customer choice in selection of construction processes that reduce negative impacts on the environment and communities and informing government policy on contracting models for construction services in a more environmentally aware way with potential application across the UK.

The overall research project specifically examines the following key areas:

- Customer choice: Allows customers of major construction projects to propose use of a Urban Construction Consolidation Centre (UCCC), both to improve the efficency of deliveries (currently, inefficiencies are simply passed on to the customer) and reduce environmental impact, across a range of projects in a geographical area.
- Effective use of transport network: The consortium links consolidation to the broader construction supply chain utilising inter-modal links via 4PL solutions. The UCCC concept will involve synchronisation with other modal termini (railway station, airport, docks).
- Enable effective working in the logistics industry: The UCCC aims to set a new standard throughout the construction logistics industry on 'just-in-time' material consolidation processes and control

- Customer focused technology development: The pilot also defines technological applications in tracking systems and the identification of optimum solutions. Principal construction companies, and their sub-contractors in the supply chain are all potential users benefiting from the efficiencies of the system. The use of consolidation in the context of regeneration may also pioneer a new approach to construction logistics with potential benefits throughout the public sector.

Whilst construction consolidation has been used in London, clients have not had the same choice outside the city (CILT Forum on Consolidation, October 2009). It is the application of existing technology and service/process methodologies in new environments that requires an innovative approach. The UCCC pilot is the first to support multiple construction projects from a permanent installation and will define new management information processes involving multi-site operations with a view to defining a new industry standard. The UCCC can provide customers with genuine choices on environmental impacts, waste, road transport congestion, and cost for the first time. By better understanding construction management behaviours it is intended to promote the take-up of consolidation techniques and have a positive impact on the industry. The novelty of this research is moving to a multi-site UCCC concept that addresses congestion and environmental considerations in a collaborative way, capturing cross-project synergies, involving collaborative partnering models that utilise shared infrastructure. It is customer-centric and focuses on sustainable system cost rather than current approaches that involve passing on incurred contractor costs, whilst neglecting environmental impact.

Further exploitable outputs from the project are in the definition of the scope and operation of a multi-site construction serving consolidation centre, and a scalable IT scheduling and tracking system to operate it. These independently audited outputs can be used to support future decision making operations through the appropriate scaling of the required UCCC (via a design yardstick). From an academic perspective, the capture of the operating model (in the form of a B2B Concept of Operations) for a multi-site serving UCCC, including the definition of processes, appropriate configuration models, and metrics will enable suitable codification for subsequent roll out.

The ConOps framework will inform a future model proposed for an Urban Construction Consolidation Centre (UCCC), based on a ‘multi-partner’, multi-site concept. This will invariably, involve ‘multi-partner’ information sharing among key stakeholders: consumers, suppliers, manufacturers, logistics service providers and retailers: hence the need for collaboration and the development of collaboration models.

Ultimately, it will enable construction material to be delivered to collaborative warehouses in which multiple supplier store their products with 'collaborative' transport from the centre will deliver to city hubs and to regional consolidation centres. Warehouse locations on the edge of cities may be reshaped in order to function, as hubs where cross docking will take place for final distribution. Non-urban areas may have regional consolidation centres in which products will be cross-docked for final distribution. Final distribution to stores, pick-up points and homes in urban and non-urban areas will take place via consolidated deliveries using efficient assets.

1.2: Concept of Operations

This research looks to develops a network level approach to establishing a common set of operating principles across a multi-organizational service network, addressing a key gap in the literature on context setting for network integration and configuration.

Within a highly partnered, multi-organisational network, emerging customer-supplier and supplier-supplier relationships have given rise to the creation of a shared "multi-entity" environment. Multi-entity service model concepts need to be developed, in order to aid partners in understanding their role and inter-relationships in service delivery. The development of a ConOps approach may be effective for multi-organizational B2B service networks due to the increasing complexity and interdependency in these operations. Key issues examined in the development of a B2B ConOps include:

- Defining the strategic intent of the B2B service network
- Business and operational environment context definition
- Establishing B2B service network operating principles as part of a high-level network configuration design
- Identifying, aligning and integrating processes across the B2B service network to achieve operational objectives
- Specifying roles and responsibilities; who should do what and when?

Hence, this research looks to develop a generic 'ConOps' for B2B networks aims to provide guidance for industry on the operating principles and protocols to be used in the design and operation of complex B2B systems.

The approach used looks to integrate current research strands on service context definition, the design and configuration of service networks, and the identification of enabling processes key to effective network integration and apply in a Urban Construction Consolidation Centre solution context. In addition to this operational perspective, developing a commercial perspective may also enable network partners and key stakeholders to define a ConOps from their own viewpoint, to include an analysis of:

- Near term planned commercial commitments, and the impact they can have on decision-making.
- How to exploit existing opportunities and levels of influence within the commercial perspective.

From a practice perspective, this methodology may then inform a more complete definition of ConOps used in multi-organizational networks – such as air transport, maritime, financial services, engineering domains – where common operating principles are required for effective B2B service delivery.

2: LITERATURE REVIEW

This section reviews the literature used in constructing an emerging B2B ConOps framework. The framework represents the operational elements of service and supply networks from the perspectives of contextual environments, organisational features, processes and capabilities. It extends the theoretical understanding of network organizations from a product perspective, towards that of services and aims to aid service providers to design and operate their B2B service networks.

Concept of operations (ConOps) terminology has already been used in many operational contexts where service providers operate in a shared environment. It is typically an overarching document applicable to all stakeholders by which individual organizations and their dispersed business units (where applicable) can develop specific operational guidance, tactics, techniques and procedures. It provides an overview as well as a strategic objective of an operation or series of operations based on a definition of the roles and responsibilities of all the related parties in an organization or network e.g. the ConOps of the US Air Force refers to a particular method of deploying resources for a particular military session (JPDO 2007), and the ConOps for product lines represents the system user's operational view for a system under development (Cohen 1999). *Table 1* presents typical examples of ConOps and their essential elements.

Analyses of these existing ConOps models was conducted which looked at the identification and codification of elements applicable to all stakeholders through which individual organizations and networks can develop specific operational guidance, tactics, techniques and procedures in order to inform a B2B context. In summary, framework development involved:

- *Industrial Context*: examining general drivers and characteristics of the industrial environment.
- *Configuration*: configuration analysis informed by the literature on network configuration models used in engineering, production, and supply networks
- *Processes*: process (capability) analysis supported by network integration literature and process mapping approaches used to identify network critical processes, particularly those processes key to network integration.

This approach, involving Industrial Context, Configuration and Process (Capability), forms the basis of developing the B2B ConOps document with the aim of building on the relationship of the contextual features, core/dynamic capabilities, and organizational characteristics of network organisations. This Industrial Context, Configuration and Process (Capability) approach has been applied in intra-firm networks and inter-firm networks across a broad range of industry sectors with a number of key projects in the past decade, e.g. international manufacturing networks (Shi and Gregory, 1998), global engineering networks (Zhang *et al*, 2007), and international supply networks (Srai and Gregory, 2008). In addition, aspects of additional research strands (reported previously), which may support the development of a B2B ConOps framework, were examined, i.e.

- Development of a common value-set amongst key B2B stakeholders (Harrington and Srai, 2011)
- Identifying processes and linkages key to service network integration (Srai, 2008; Harrington and Srai, 2012)

- Identifying and defining key performance indicators in terms of 'multi-organizational networks' (Harrington *et al*, 2012)

Table 1. Summary of the essential elements of a Concept of Operations (ConOps)

Key Elements of ConOps	ConOps for Next Generation Air Transpiration System (JPDO 2007)	ConOps for Maritime Domain Awareness)	ConOps of Defence Agencies Initiative	ConOps for Product Line Development (Cohen 1999)	ConOps for an Engineering Function
Application Domain/Scope	Air transportation	Maritime	Financial services	Software product development	Engineering function
High Level Definition and Main Objectives	A ConOps provides a common vision of how a system will operate through forming a baseline that can be used to initiate a dialogue with stakeholders to develop the policy agenda and encourage the research needed to achieve the goals.	A ConOps is a description of how discrete, collective, or combined capabilities will be managed and employed to achieve desired objective, or to test experimental technologies or concepts.	A ConOps will address the key issues including solution frameworks, future capabilities, alignment with related systems, common and unique processes and operations.	A ConOps is to describe the characteristics of the process to establish the desired product line from an operational perspective. It will facilitate understanding among stakeholders and form an overall basis for long-term planning. It will also describe the organization and define the role of acquisition.	A ConOps defines the policy, organization structure, roles, responsibilities and performance of engineering operations.
Contextual Environments	Environmental considerations	Problem statement	As-is situation and to-be situation	Constraints	Operating context defined by corporate operational framework
Output Requirements	Eight service delivering packs/requirements for next generation transpirations		Output solution requirement including future requirements		
Performance Measures	Performance management defined as one of the service packs	Assessment processes	Narrative definitions of desired performance		Performance measures defined
Organizational Structure	Operational overview		Functional structure		Organizational structures, roles and responsibilities
Operational Processes	Processes for various operational services	Processes and procedures to align activities (who, when, what & how)		Specific operational activities- who does what and when.	
Relationship with Partners		Inter-agency coordination			
Support Infrastructure	Infrastructure services	Critical infrastructure defined			Support roles

In summary, figure 1 sets out the relationship of the proposed ConOps B2B framework against existing approaches and related operational models examined during this research.

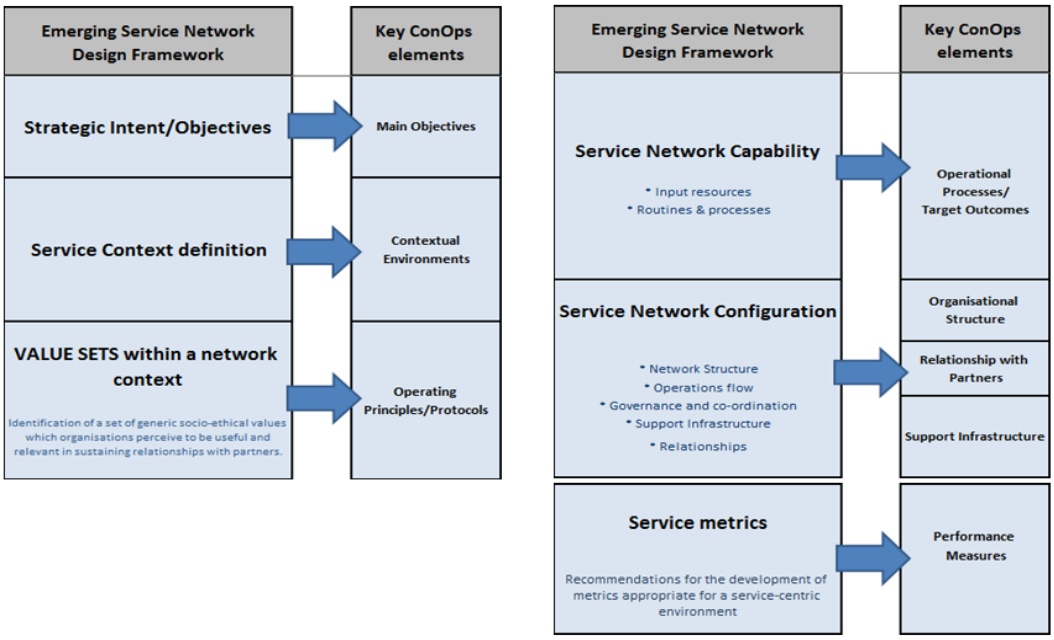

Figure 1. An Emerging Framework for Service Network Design and associated ConOps elements

The next sections (2.1-2.5) aim to inform the problem to be solved and the 'system' as it currently exists, e.g.

- What is the 'system' i.e. B2B service network?
- What is the 'B2B service network' supposed to do?
- How well does the B2B service network currently perform?
- What is meant by configuration in a B2B service network context?
- Where can the B2B/B2I service network used?
- How will the B2B service network operate?
- What other 'systems' does/will B2B service networks interact with?

With the ConOps for B2B/B2I networks drawing on e.g. industry context, capability, and configuration elements, it should demonstrate how the above elements contribute the strategic objectives of the network, e.g. greater efficiency, improved innovation, capability and flexibility. Networks in different contexts will have different strategic objectives, and hence different sets of processes, process linkages and organisational features. Network members should be organized and coordinated consistently for the strategic objectives. Additional questions for a B2B/B2I ConOps checklist will help the members of a service supply network to understand:

- How to achieve the strategic objectives in certain contextual circumstances?
- What kinds of processes/capabilities are required to achieve the main objectives and how to measure performance?
- How to design or configure the network to effectively deliver processes/capabilities.

2.1: Industrial Context

Research has previously used two dimensions to differentiate business/organizational environments: complexity and dynamism (Child 1972; Duncan 1972; Sia *et al*, 2004). Complexity refers to the heterogeneity and range of environmental activities that are relevant to an organization's operations (Child 1972). It can be measured by whether the environment leads to difficulties in gathering sufficient and necessary information, analyzing the causes and effects, or predicting the trends and outcomes (Sia *et al*, 2004). Dynamism refers to the degree of change that characterizes environmental activities relevant to an organization's operations (Child 1972). It may be measured by the rapidity of changes or the number of possible outcomes in the environment (Sia *et al*, 2004). Networks within different contexts will have different strategic objectives. In this approach industrial context is extended to refer to the environmental features of network organizations, which are influenced by internal and external factors e.g. institutional trends, industrial trends and firm level strategies and informs '*target outcomes*' and '*contextual environments of operations*', e.g. the constraints, key problems, current situation or background, for an emerging ConOps.

2.2: Network Configuration

The network configuration approach used focuses on establishing patterns or profiles. According to configuration theory, the alignment of strategy and systems or practices is reflected in the patterns observed in practice. This emerging framework represents the operational elements of service supply networks from the perspectives of contextual environments, processes and capabilities, and organisational features. It extends the theoretical understanding of network organisations from a service perspective and will help industries to design and operate B2B networks.

A key challenge is the migration path to service supply networks. These involve the development of new ‘concepts of operation’ or the selection of service operating models, and in many cases, the progressive transfer of operational processes between customer and supply organisations. The development of these operational frameworks, need to be supported by organisational routines (process capabilities), some of which may be model-specific.

The network configuration approach used focuses on establishing patterns or profiles. According to configuration theory, the alignment of strategy, systems or practice is reflected in the patterns observed in practice. Firm-based configuration concepts are widely recognized in the strategic management and organizational structure literature. Strategic management literature has identified different types of configurations with distinguishable strategic objectives, target markets, critical resources, and operational behaviors (Chandler 1962; Khandwalla 1970; Rumelt 1974; *Miles and Snow*, 1978; Mintzberg 1979; Miller 1996). Firm configurations are usually described by the characteristics of organizational structures and coordination mechanisms (Chandler 1962; Mintzberg 1979; Miller 1996). Mintzberg (1979) considered configuration as a combination of certain characteristics of structure and situation which organizations naturally fall into. Organizations will not function effectively when such characteristics are mismatched. Organizational elements should be logically configured into internally consistent groupings because they are usually interrelated in complex and integral ways (Miller 1986). Firms may be driven towards common configurations to achieve internal harmony among elements of strategy, structure and context (Miller 1986). Cohesive configurations are composed of tight constellations of complementary and mutually reinforcing elements, which could be predicatively useful because the number of possible ways in which constructional elements are combined is reduced. With this viewpoint, configuration can be viewed as a constellation of organization elements that are pulled together by a unifying theme. The description of configuration includes a firm’s core mission and its fundamental means to accomplish the mission in a certain market, and the systems, processes, and structures to support the core operations.

In recent years, business activities are increasingly dispersed across geography and ownership boundaries. There is a growing research community working on network configurations, especially in operations management and strategic management (Shi and Gregory, 1998; Bozarth and McDermott, 1998; Oltra *et al*, 2005; Zhang *et al*, 2007; Srai and

Gregory, 2008). Shi and Gregory (1998) contended that the dispersion and coordination of manufacturing networks require different international manufacturing capabilities from the perspectives of efficiency, mobility, resource accessibility and learning ability. The dispersion dimension refers to the structure of a network; and the coordination dimension emphasises on the relationship between network members. Zhang *et al* (2007) identify four types of contextual environments of global engineering networks; capturing the core capabilities of engineering networks in each context and demonstrated the organizational features to deliver the capabilities. Engineering network configuration has been described from the perspectives of network structure, governance and coordination, and support infrastructure. The research introduces two new dimensions - governance system and support infrastructure, which have strong relationships with the capability and context of engineering networks. Srai and Gregory (2008) describe the configuration of supply networks from the perspectives of network structure, flow of information and material between/within operation units; relationships between network partners; and product structure. The research highlights the importance of relationship with internal and external partners. Although different type of 'products' demand different network capabilities, hence the network configuration to deliver the capability, product configuration also plays a key role in service network dynamics.

The literature demonstrates the evolving process in understanding the organizational features of different types of networks, including intra-firm and inter-firm operations, for manufacturing, engineering and service supply chain functions.

For a network involving multiple players, taking a multi-organizational perspective, these individual research strand inputs can be usefully integrated as:

- *Structure:* to describe the geographical footprint of a network, including the dispersion of network units and their interdependence, characterized by the degree of dispersion (dispersed v. concentrated), and the interdependence between centres (independent v. interdependent).
- *Network Dynamics:* to describe the operational processes adopted by network members, characterized by their degree of standardization (standard v. tailored /bespoke).
- *Governance and Coordination:* to describe the governance system and coordination mechanism of a network, characterized by their degree of centralization.

- *Support infrastructure:* to describe support infrastructures of a network, including IT systems, resources, people, and cultures, characterized by their degree of unification (uniform v. customised) and globalization (global v. local).
- *Relationships:* to describe the linkage between network members, e.g. customers, suppliers and users, characterized by their strategic importance (strategic vs. tactical), degree of trust (trust vs. transactional), and scope (global v. local).

Table 2 summarizes the key elements employed by researchers in studying the 'configuration of network organizations'. The term 'network' here covers the operational unit of analysis under study – this can be a single function or combination of engineering, production, supply network and service across the value chain, which can inform *'organizational structure'*, *'relationship with partners'* and '*support infrastructure'* aspects of an emerging ConOps framework.

2.3: Network Integration

A key challenge in this research is the migration path to service supply networks. This involves the development of new 'concepts of operations' or the selection of service operating models, and in many cases, the progressive transfer of '*operational processes'* between customer and supply organizations. The development of these operational frameworks needs to be supported by organizational routines. Operational capabilities refer to the capacity of a team of resources to perform such tasks or activities (Grant 1991).

Creating capabilities is not simply a matter of assembling a team of resources because capabilities involve complex patterns of coordination between people and other resources (ibid 1991). From a similar perspective, capability has been defined as a high-level routine (or collection of routines) that, together with its implementing input flows, confers upon an organization's management a set of decision options for producing significant outputs of a particular type (Winter 2003). To gain capabilities from resources, an organization needs to achieve integration, cooperation and coordination between individuals and teams (Barney 1991; Grant 1991; Mills and Platts, 2003). In changing environments, an organization needs the ability to create, integrate, and reconfigure resources into new sources of competitive advantages (Teece *et al*, 1997; Helfat and Peteraf, 2003). Dynamic capabilities have thus been considered as the organizational and strategic routines, by which an organization achieves new resource configuration as markets emerge, collide, split, evolve, and die (Eisenhardt and Martin, 2000).

Table 2. Key elements of network configuration.

Configuration Elements	Global Engineering Networks (Zhang *et al*, 2007)	International Manufacturing Production Networks (Shi *et al*, 1998)	International Supply Networks (Srai *et al*, 2008)	Service Supply Networks (Srai, 2008; Harrington *et al*, 2012)
Structure	Geographic Dispersion; resources and Roles of Engineering centres; Rationales for Network structure Design	Plant role Characteristics; Geographic Dispersion; network evolution	Supply network tier structure and shape; geographical dispersion; supply network mapping; integrating mechanisms	Multi-organizational network structure; service archetypes
Process/ Operations Flow	Operational processes supporting engineering information flows	Response Mechanisms	Flow of Materials and Information Between and within Key unit operations; Replenishment mode and supply-demand dynamics	Service supply contracting mode; through-life perspectives
Governance and Coordination	Governance, Including authority Structure and Performance Measures	Horizontal and vertical Coordination	The role of key network partners and inter-firm governance mechanisms	Service network governance modes
Support Infrastructure	Support, including Engineering tools And IT systems			Support systems
Relationships		Intra-firm dynamic capability building	The role of key network partners and inter-firm relationships	Partnering modes; firm and network value sets
'Product'		Product lifecycle and knowledge transfer	Product modularity; SKU portfolio/profile	Service offering; outcomes/effects

A methodology for identifying industrial network integration processes across multi-organizational networks has been developed (Iakovaki *et al*, 2009) and includes a process hierarchy that helps to support the integration of business, strategic and operational drivers, as well as to support the development of shared goals across the network. Despite an inherent complexity, integration challenges can be narrowed down to key processes or 'linkages' between partners. The complex phenomenon of multi-organization network (MON) integration requires capturing the perspectives of all the various partners involved in the integrative activities (McCarthy, Golicic in Kotzab *et al* 2005). Previous studies have also shown that such integration factors can promote successful collaboration (Nyaga *et al*, 2010) and a comprehensive definition of the processes that support network integration have also been presented (Croxton *et al*, 2001). Preliminary results informing this research demonstrate that the evaluation of these operational processes against a set of network integration enablers i.e. *Common Goals, Shared Risks and Rewards, Network Synchronization, Collaborative Resources, Knowledge Sharing,* informed by literature and tested within an operational environment, can help identify critical process-based capabilities in multi-organizational service networks (Iakovaki *et al*, 2009). Adaptation of these process hierarchy and network integration methodologies can inform the '*operational processes*' aspect of an emerging ConOps framework.

2.4: Development of common 'Value Sets' for the service network

The defining of common value-sets from a network perspective has been identified as a key element in the development of the ConOps framework. As networks are typically formed by heterogeneous and autonomous entities, it is natural that each member has its own set of values. The aligning of members' value sets (creating a value system) within a multi-organisation service network is useful in defining operating principles and protocols.

The approach developed in this document focuses on the perceptions of shared value within these multi-organisational networks, building on literature on individual and firm-based values. It introduces and identifies a set of generic socio-ethical values that organizations perceive to be useful and relevant in sustaining relationships with partners. These include co-operation, trust, respect of IP, data security, commitment to objectives, equal rewards, commonality of objectives, defined roles, responsiveness to partners/problems and communication.

2.5: Service Metrics

A methodology and recommendations for the development of metrics appropriate for a B2B service-centric environment have previously been reported (Harrington *et al*, 2012) which will inform development B2B ConOps in a UCCC context (future work).

3. EMERGING CONOPS FRAMEWORK

The following emerging ConOps framework for Multi-Organizational Networks (MON), and applicable to B2B networks, aims to set out an operating philosophy for service supply networks is presented. It is based on existing service supply chain studies, network theory and underpinned by MON case studies. While previous ConOps models broadly identify key elements, they are not properly defined (see *table 1*).

The approaches of network configuration and processes key to network integration, identified in this paper, provide a standard definition of the main elements of a ConOps (i.e. target outcomes, contextual environments, organizational structure/relationship with partners/ support infrastructure and operational processes etc.), which are summarized in *Table 3*.

Table 3. Concept of Operations (ConOps) framework for Multi-Organisational Networks (MON) setting out the key elements and operating philosophy for service supply networks.

ConOps Framework Elements	Description of ConOps Element
Main Objectives	Enables the specification of objectives and target outcomes
Contextual Environments	Sets out the main industry actors, the business and operational environment and contracting type (e.g. spares and repairs, cooperative partnerships, contracting for availability, contracting for capability)
Operating Principles/Protocols	Support by e.g. co-operation, trust, respect of IP, data security, commitment to objectives, equal rewards, commonality of objectives, defined roles, responsiveness to partners/problems and communication
Operational Processes/Target Outcomes	Enables definition of a hierarchy of capabilities (supported by a process-capability hierarchy) to explore how different projects compare in terms of industrial capability requirements. Enables identification of key priorities in terms of future requirements to which an organisation will have to respond to. Also, there is scope for an organisation to develop specific industrial capabilities.
Organisational Structure/ Relationship with Partners/ Support Infrastructure	Enables identification and understanding of the key 'touch points' in the organisation's dealings with external organisations and across business units e.g. utilisation of collaborative resources, data sharing, interoperability and efficient IT system elements (and their associated sub-elements) from network integration enablers
Performance Measures	Enables definition of the key performance indicators in the service aspect of the business to ensure alignment with the 'service' organisation's strategy (in progress)

Conclusion

This paper has reviewed different types of ConOps in practice to see their main tasks and key components. In addition, literature on network organizations and service networks have been was reviewed to understand the characteristics of B2B service networks. The research on industry context-capability-configuration for network operations was used to integrate the essential elements of ConOps and the requirements of service network operations. This research paper sets out the basis of a ConOps framework to provide guidance for firms to design and operate their B2B networks and is currently in the process of being tested for the UCCC concept.

Future Work

Outputs from this research to-date have culminated in the drafting of a *Planning Guidance Note* for the Local Authority supporting the UCCC concept (currently in the approval loop). This guidance note is intended to provide the policy context for the promotion of the UCCC concept, and suggests how it can be incorporated into Local Development Documents and how such policies could be operated through the Development Management process. This provides a critical output for the UCCC project and has the potential of effecting major planning policy change (e.g. opportunities to encourage the UCCC concept through the planning process by introducing requirements for the use of construction plans, construction statements and transport assessments for construction and operational phases to minimize trips, contract deviation and waste). On-going work is looking to capture and incorporate these considerations and impacts as part of further ConOps framework development and will be tested using the in-depth case study involving the UCCC concept.

Ultimately, it is aimed to capture generic patterns that may be valuable for service networks in particular situations (e.g. air transport, maritime, financial services, engineering domains – where common operating principles are required for effective B2B service delivery) and to develop practical tools and processes for such industries to optimize their B2B and B2I networks or design new networks for future success.

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