The Co-Creation Design Framework

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Co-creation is a valuable activity for organisations, but it can be costly if there is limited understanding of when co-creation is appropriate and for what purpose. Frow et al. (2015) developed the Co-Creation Design Framework as a strategic management and reflection tool for co-creative activity, with the view of helping firms to plan for and seek out co-creative innovation opportunities. However, there are notable limitations: the framework is firm centric, expert reliant and product development focused. By analysing case studies of Masters Student projects which encompass the contexts of social innovation and service design, the current study expands the framework scope. A Developed Co-Creation Design Framework is presented with adaptations and additions to the original, creating a strategic management tool which can be used in product, service and social innovation within an education setting. Directions for future research are given to help expand and refine the framework further.

Keywords: Co-creation; Strategic Management; Framework; Design

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Introduction

Co-creation is a widely researched and accepted term, and it is evident that co-creative activity can generate new forms of value for organisations who invest resource into it (Brown, 2013). However, Frow, Nenonen, Payne and Storbacka (2015) have exposed a weakness in this wealth of literature. The authors highlight that there is little understanding by organisational managers of *how* and *why* to be co-creative, and therefore do not take a strategic approach to the integrating co-creation into their organisation. Frow et al. (2015) developed a Co-Creative Design Framework ('CCDF') which aims to fill this knowledge gap and support a strategic approach to co-creation, enabling organisations to plan for and scope out co-creative opportunities. However, this framework has limited scope. Frow's study (*ibid*.) analysed organisations with co-creative capacity already embedded, and with the ability to be the 'lead actor' throughout the co-creative process. Additionally, the framework was developed from a product design perspective, and is not sympathetic to social innovation or service design.

This research evaluates the CCDF based on social innovation and service design contexts and adapts the framework to improve the scope as a planning, assessment and reflection tool in an educational setting. This research critiques and evaluates the CCDF by developing three case studies based on Masters Student projects which were student-led with organisations that are inexperienced with co-creative practices. The projects varied in length and amount of engagement from the focal organisation, which was intermittent (rather than constant) throughout the projects. The case studies also covered the contexts of service and experience design and social innovation. Each case study was mapped onto the framework, evaluated and adapted. By analysing the framework in this way, the current research was able to adapt and expand the framework to encompass a larger range of co-creative project types, and develop avenues for future research that will help refine and strengthen the framework, as well as broaden its applications further still.

The Paper

This paper provides a critical analysis of the CCDF based on three Masters Student projects, presenting an edited version of the framework which better suits an educational setting and co-creative activities aligned to social innovation and service design. Within the paper there is:
- A review of literature about co-creation and its value.
- A critical analysis of the current CCDF.
- Three co-creative innovation practice case studies and an evaluation of the framework's fit.
- A presentation of an adapted CCDF which the authors argue is more applicable to social, product, and service innovation projects in education.

Scope

This study adds to the understanding about the management and strategic use of co-creation. It responds to the limitations of the Frow et al. (2015) study, by testing the framework in the context of social innovation and service design with actors who are less accustomed to co-creative project work as part of education based projects. The research focuses on three design-led student-based co-creative projects, selected after a review of fifteen projects, undertaken within a Masters programme in the last 24 months.

LITERATURE REVIEW

Co-Creation and its Value

Co-creative activity is undoubtedly valuable to organisations. Co-creation can enable organisations to overstep boundaries, and "align diverse interests, agendas and priorities" so that an organisation can become more innovative within itself, and its outward facing offer (Brown, 2013). Integral to the most successful co-creative activities, is collaboration across a wide ranging internal and external stakeholder network (Nieters & Bollman, 2011; Gummesson & Mele, 2010; Blomqvist & Levy, 2006). Blomqvist and Levy (2006) state that "collaboration capability is a focal concept in knowledge creation and collaborative innovation in networks". Collaboration in co-creation helps to leverage the insights of various disciplines, positions, job roles, user groups (and more) to integrate into thinking, and ultimately develop a more unified and satisfying outcome for all involved parties (Nieters & Bollman, 2011; Ramaswamy, Gouillart, Simon & Schuster, 2010). It must be noted that co-creation is distinct from open innovation. Open innovation considers the collaborative sharing between organisations of intellectual property, whereas co-creation refers "to the relationship between an organisation and a defined group of its stakeholders, usually its customers" (Neumann, 2014). The notion of collaborative co-creation, however, considers the involvement of organisations and customers alike, along with

other key stakeholders as part of a network (Adleret al., 2011; Gummesson and Mele, 2010; Ramaswamy & Prahalad, 2010). However, despite the wealth of literature which discusses and demonstrates the value of co-creation there is limited research which offers a strategic approach to co-creation, particularly in identifying potential co-creative opportunities.

Research has established that organisations often strive for co-creation but do not have a strategic understanding of how to identify when and what form of co-creative activity would be most advantageous or generate most value for their company (Frow et al., 2015). Co-creation exercises can be costly to an organisation if they look to involve a network of actors, or have an endured engagement (Nuttavuthisit, 2010). These factors underline the importance of a strategic approach when considering co-creative activity, rather than taking a more impromptu approach. Furthermore, co-creation is often thought of as the generation of ideas for new products or services (Frow et al., 2015), but is much more than that. Frow, Payne and Storbacka (2013) developed 'A Typology of Forms of Co-Creation', which identifies 12 different forms of co-creation that can be of benefit to an organisation and lead innovative solutions (see Figure 1). Thus, if an organisation was to focus on co-creative idea generation alone, many other forms of co-creative innovation are being missed.

A Typology of forms of co-creation

The ten more discrete forms of co-creation are:

(1) *Co-conception of ideas* refers to two or more actors collaborating on product concept innovation. e.g., Complex technological solutions, such as in the development of Airbus 380.

(2) *Co-design refers to two or more actors sharing their respective design perspectives*. e.g., customized design solutions such as in Dell computers and sports shoe designs for Adidas.

(3) *Co-production refers to when two or more actors jointly produce all or part of the focal actor's (firm's) offering*. e.g., IKEA self-assembly of merchandise.

(4) *Co-promotion refers to two or more actors collaborating on promotional activities related to a specific product, brand or other entity*. e.g., Brand communities, such as BMW.

(5) *Co-pricing refers to collaborative pricing decisions that involve two or more actors and reflects their joint pricing perspectives*. e.g., Radiohead 'pay what you want' downloads.

(6) *Co-distribution refers to when two or more actors collaborate to distribute goods and services, usually for end-use consumption*. e.g., P & G/suppliers' shared consolidation.

(7) *Co-consumption involves collaboration during usage, as actors employ their resources (physical, social and/or cultural), individually or collectively, as co-consumers to determine and enhance their own consumption experiences*. e.g., Wet Seal clothing online users.

(8) *Co-maintenance refers to two or more actors sharing in the maintenance services of a core product*. e.g., Tesco's hot line where customers report damaged or discarded trolleys.

(9) *Co-outsourcing refers to two or more actors, including suppliers, customers, competitors or other actors, collaborating in outsourced solutions*. e.g., www.elance.com.

(10) *Co-disposal refers to two or more actors collaboration in disposal tasks* e.g., Columbia Sportswear's use of recycled boxes.

The two more aggregative and cumulative forms of co-creation are:

(11) *Co-experience involves actors integrating their resources over time and across multiple encounters creating a shared experience, with different outcomes than those occurring in more discrete individual interactions*. e.g., Tesco's suite of sub-brands: Baby Club, Toddler Club, etc. that provide opportunities to co-experience at specific life-stages.

(12) *Co-meaning creation refers to interactions between actors that produce new meanings and knowledge through multiple encounters over time*. e.g., On-line gamers' shared meanings.

Figure 1: A Typology of forms of co-creation. Source: Frow, P., Payne, A., & Storbacka, K. (2011, November). Co-creation: a typology and conceptual framework. In Proceedings of ANZMAC (pp. 1-6).

The Co-Creation Design Framework

In response to these findings, and in an attempt to maximise innovation through a more strategic approach to co-creative activity, Frow et al. (2015) developed the 'Co-Creation Design Framework' (see Figure 2). The CCDF is proposed as a planning tool for organisations to identify co-creation opportunities by choosing the most suitable categories across the six dimensions ('Co-creation motive, Co-creation form, Engaging actor, Engagement platform, Level of engagement, and Duration of engagement), improving resource integration and understanding of creative intent. The paper discussed that new forms may be discovered and added through further interrogation. The framework was created through a series of workshops, where an agreement between managers and researcher took place to compile the final version. This process involved the display of the CCDF, and managers described the relevance of categories, their dimensions and their concurrence on the

framework's appropriateness (Frow et al., 2015). The framework provides a structured approach for developing innovative new strategies, concepts and solution.

Dimensions					
Co-creation motive	Co-creation form	Engaging actor	Engagement platform	Level of engagement	Duration of engagement
Access to resources	Co-conception of ideas	Focal firm	Digital application	Cognitive	One-off
Enhance customer experience	Co-design	Customer	Tool or product	Emotional	Recurring
Create customer commitment	Co-production	Supplier	Physical resources, spaces/events	Behavioural	Continuous
Enable self-service	Co-promotion	Partner	Joint processes		
Create more competitive offerings	Co-pricing	Competitor	Personnel groups		
Decrease cost	Co-distribution	Influencer			
Faster time to market	Co-consumption				
Emergent strategy	Co-maintenance				
Build brand awareness	Co-outsourcing				
	Co-disposal				
	Co-experience				
	Co-meaning creation				

(The leftmost spanning label reads "Categories")

Figure 2: The Co-Creation Design Framework. Source: Frow, P., Nenonen, S., Payne, A., & Storbacka, K. (2015). Managing Co-creation Design: A Strategic Approach to Innovation. British Journal of Management, 26(3), 463-483.

The Co-Creation Design Framework: Limitations

The CCDF provides a practical and initial understanding of how organisations can become more strategic when approaching co-creation. There are, however, notable limitations: the framework is firm centric, expert reliant and product development focused. As a result, the authors suggest that the co-creation dimensions and categories should be considered and adapted based on future findings in these alternate contexts, particularly in social innovation and service design. Furthermore, the original study focuses on organisations which have the capability and ability to be the 'lead actor', and so there is a linear involvement of actors throughout the co-creative process. When considering educational based projects, this type of involvement is not typical. Often the project is lead by students, and organisational involvement is intermittent throughout. Another consideration when discussing the application in an educational setting is that workshops are used as a platform to engage with multiple actors. Workshops can provide an arena for sharing perspectives, forming visions and creating new solutions, and so is an invaluable tool to assist co-creation (Soini & Pirinen, 2005). Despite the value and co-creative potential, Frow et al. (2015) have grouped workshops into a 'Physical resources, spaces/events' category, dismissing the variety of activities which occur within this category when considering workshops alone.

There are a number of challenges and limitations of the current framework when trying to apply it within an educational based setting. Particularly, are the dimensions and categories appropriate when considering these types of projects, and how may they differ? More explicitly, how does the framework evolve when the lead actor is not the organisation, but student facilitators? And how does intermittent involvement from the focal organisation as part of a co-creative project process fit, or change, the current framework? Finally, as workshops are the centre of multiple actor engagement in these settings, does this pose an argument for an even more granular level to the CCDF?

RESEARCH OBJECTIVE

The current study will analyse and evaluate how the CCDF (Frow et al., 2015) fits to design-led innovation student projects, with actors who are less accomplished in co-creative working. The CCDF is analysed in an educational setting to consider its application as a management tool to support the student facilitators and as a learning tool for both the students and the focal organisations. Particularly, categories of co-creation are considered in the context of social innovation and service design projects to increase the framework's relevance. Finally, the intermittent involvement of the focal organisation throughout the co-creative process is considered in contrast to linear involvement as seen in the original study. The main research questions for this study are as follows:

- How does the CCDF map onto design-led innovation student projects?
- What are the resulting developments from applying this framework in a new context?

METHOD

This study has been conducted by reviewing three Masters Student projects, developing three case studies to analyse and evaluate the CCDF in new contexts of social innovation and service design, for an educational purpose and with intermittent involvement from the lead organisation. The three case studies were chosen from a review of fifteen student projects as they cover a spectrum of engagement activities with a lead organisation, vary in project length and have been conducted within the last 24 months. The researchers developed the case studies through: a review of project materials, semi-structured interviews and online surveys with the participating student groups and semi-structured interviews with the projects' academics. The retrospective nature of the study enabled critical analysis of the CCDF and helped in understanding the framework as both a planning and assessment tool. One limitation of the retrospective nature of the case studies, however, is that the lead organisations' perspective was not captured at the time of the project, and so assumptions have been made. Through this research the authors offer suggestions for developing the CCDF to better suit a range of innovation contexts, past the current scope of product design.

CASE STUDIES

The authors have compiled three case studies which focus on Masters Student projects with varying timescales and actor engagement. The case studies will give a brief overview of the project context, highlighting the type of engagement activity taken place with different actors during the project. The projects are mapped onto the current CCDF, highlighting where the current categories are suited to these types of project and contexts, and where the present framework falls short.

Northumbrian Water Group

Overview The Northumbrian Water Group (NWG) project was a 5-day Sprint - a structure to lead a team through an intensive design-led innovation process in a short timeframe. NWG were interested in engaging with their diverse customer base. This project explored ways to engage 'hard to reach customers' through a mobile hub. The student teams used insights generated throughout the week to develop proposals for the client, resulting in three design concepts with an overarching strategy for the business. Academics and Project Leaders created the Design Sprint inspired by the 'Five Stages of Working'; an innovation process developed as a result of academic research; a review of three years' projects (over 36 project iterations.) Each day had a set agenda with a number of activities appropriate to achieving daily objectives. The days were named as followed; Set Up, Problem & Solution Evolution, Strategy, Pitch and Unpack. The clients were involved in different engagement activities at three points during the week, and each interaction had a predetermined purpose. This can be seen in Figure 3 below.
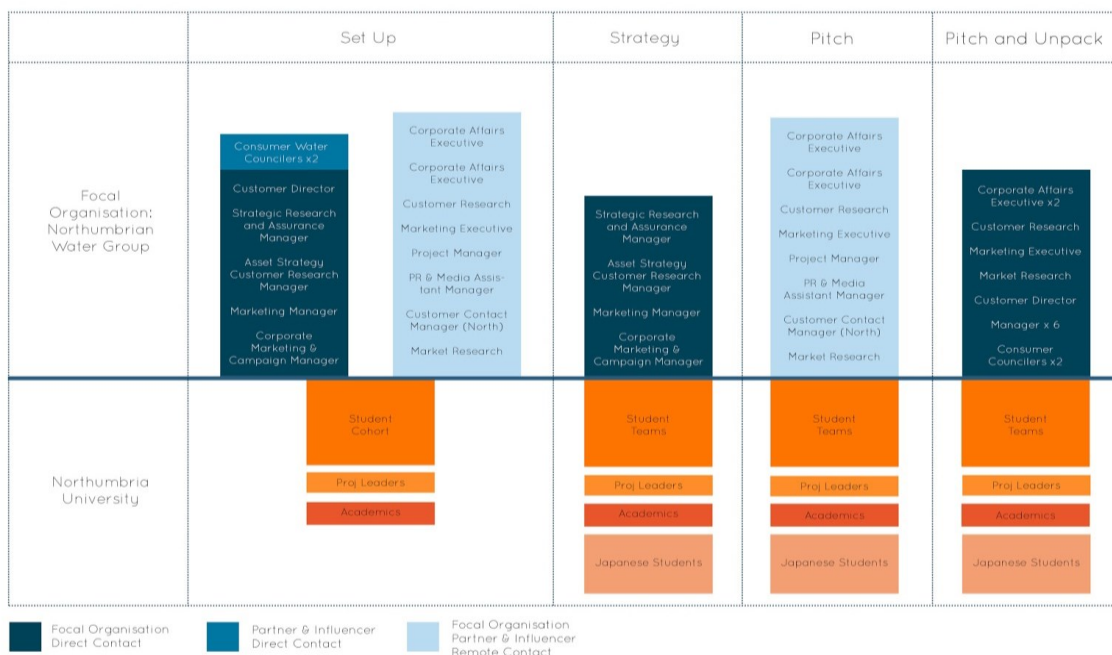
Figure 3: Northumbrian Water Group Project - Stakeholder Engagement. Source: AUTHOR

Engagement Activity

Day one (Set-Up): Defining the project scope and opportunity spaces. This day was to develop an understanding and a clear position about the challenge from a range of different perspectives. In the morning, NWG management and two external partners briefed the students and were involved in a question and answer session with a range of company stakeholders, enabling different perspectives to be understood and queried. Additionally, tele-interviews with NWG employees were conducted; this increased depth of understanding and knowledge accumulation through discussions with a wide scope of staff. An understanding of hard to reach 'domestic' customers was arrived at through informal conversations.

Day Two (Problem & Solution Evolution): Developing concepts. This day was to generate many ideas as a response to the understanding arrived at in Day One; to cluster ideas to form concepts that deliver clear value and address specific client challenges. During this day there was no client engagement.

Day Three (Strategy): Resource and delivery planning. This day was to refine concepts by developing a concept costing and delivery plan embedded within an engagement strategy. Through informal meetings, in the afternoon, the Customer Director, Strategic Research and Assurance Manager and the Asset Strategy Customer Research Manager were present to discuss implementation plans, budget and resource requirements with student teams. The staff considered the concepts and helped the students make the proposals more grounded within NWG's values and future visions, and provide details about resourcing.

Day Four (Pitch): Evaluative and co-creative feedback. This day was to develop concept communication packages which could be shared for critique and creative input from NWG. Through digital correspondence, the students sent presentations visualising and communicating concepts. Evaluative and co-creative feedback was received remotely the same day, giving the students chance react and revise their project proposals. This also gave the clients a chance to input on the proposals and direction of the project.

Day Five (Pitch & Unpack): Review, evaluate and consolidate. This day was to review the learning and insight developed during the week in order to construct a coherent project proposal. Concepts were integrated into an overarching engagement strategy with a rationale supporting concept proposals. The team presented the outputs to 20 NWG employees to receive reactions, comments and questions late afternoon.

Current CCDF & the NWG Project

Using the case study and semi-structured interviews with project leaders, academics and student group, the NWG project was mapped onto the current CCDF, removing any categories which were not addressed (see

Table 1). Although all dimensions and some categories were appropriate, there were some elements of the project which could not be applied to the framework in its current form. Additional co-creation motives for the NWG project were to sense check current thinking, and for the student group to generate concepts from the current NWG proposals. Furthermore, the actors scoped ideas for future directions as well as strategies for engagement, these being forms of co-creation which are not addressed in the framework. Due to the nature of the projects, there were more actors involved; project leaders, the student group and academics were all present and engaging throughout the week.

Table 1: Categories of the current CCDF which were relevant to the Northumbrian Water Group Project

Categories	Dimensions					
	Co-creation motive	**Co-creation form**	**Engaging Actor**	**Engagement Platform**	**Level of Engagement**	**Duration of Engagement**
	Access to resources	Co-conception of ideas	Focal firm	Physical resources, spaces/events	Cognitive	Recurring
	Enhance customer experience	Co-production	Customer	Digital	Emotional	Continuous
	Create customer commitment	Co-experience	Partner		Behavioural	
	Create more competitive offerings	Co-meaning creation	Influencer			
	Faster time to market					
	Emergent strategy					
	Build brand awareness					

North Tyneside Academy Foundation

Overview The overarching purpose of the North Tyneside Academy Foundation (NTAF) project was to help the company expand, driving the business forward with sound revenue streams and clear business goals. The brief was co-created with the client as a result of a workshop and the project objective was twofold: Create a strategic business development plan and a communications package. This student led project spanned three months and was supported by one lead academic. The project team followed 7 stages of working: 1. Problem interpretation, 2. Scoping initial idea development, 3. Insight generation and initial idea development, 4. Strategy development and in-depth investigation, 5. Interim presentation & refinement, 6. Final outputs, 7. Further considerations and conclusion (Bailey, Aftab, & Smith, 2015). The type of client involvement during this project was workshop based; 4 workshops within 3 months, with some email correspondence for organisational purposes. The first two workshops were during stages one and two; the final workshops were during stages four and five.

Engagement Activity

There were four workshops which were in two main formats: 1. Information gathering, 2. Opportunity seeking and co-creation. Figure 4 illustrates which actors were present during each workshop. The only other engagement from the focal organisations was via email, but this was purely for organisational purposes.
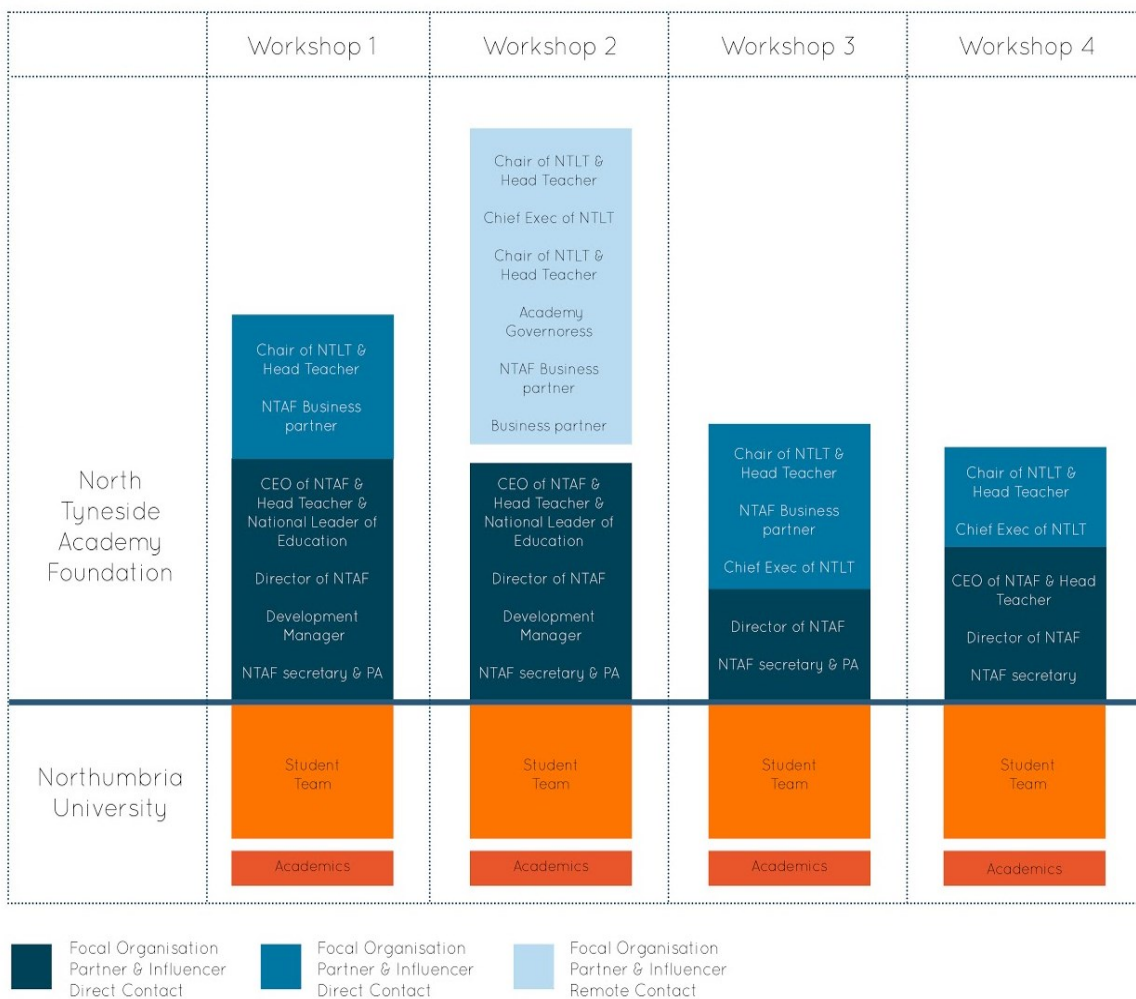
	Workshop 1	Workshop 2	Workshop 3	Workshop 4
		Chair of NTLT & Head Teacher		
		Chief Exec of NTLT		
		Chair of NTLT & Head Teacher		
		Academy Governoress		
		NTAF Business partner		
	Chair of NTLT & Head Teacher	Business partner		
	NTAF Business partner		Chair of NTLT & Head Teacher	Chair of NTLT & Head Teacher
North Tyneside Academy Foundation	CEO of NTAF & Head Teacher & National Leader of Education	CEO of NTAF & Head Teacher & National Leader of Education	NTAF Business partner	Chief Exec of NTLT
	Director of NTAF	Director of NTAF	Chief Exec of NTLT	CEO of NTAF & Head Teacher
	Development Manager	Development Manager	Director of NTAF	Director of NTAF
	NTAF secretary & PA	NTAF secretary & PA	NTAF secretary & PA	NTAF secretary
Northumbria University	Student Team	Student Team	Student Team	Student Team
	Academics	Academics	Academics	Academics

Focal Organisation Partner & Influencer Direct Contact
Focal Organisation Partner & Influencer Direct Contact
Focal Organisation Partner & Influencer Remote Contact

Figure 4: North Tyneside Academy Foundation Project - Stakeholder Engagement. Source: AUTHOR

Workshop One: Information gathering/understanding the company, brief, expectations and relationship building. Facilitated by the students, activities were arranged to find out more about NTAF, and what an academy sponsor does. Activities included a timeline of the transition to an academy with an understanding of the voluntary and forced actions in comparison to a more generic timeline of how and why schools convert into an academy, using a stakeholder mapping tool to gain the insight of key stakeholders. The students facilitated an open discussion, with the objective of building a brief and scoping out the project aims. This workshop was the building block to the initial brief.

Workshop Two: Deeper understanding of the company, its future and co-creation of the brief. Activities to define NTAF's future vision were explored. Core values and beliefs were defined; a transition timeline was used for a deeper understanding of how a past transition to a school was done by NTAF and how the stakeholders felt, and what they would do differently if the opportunity arose again. A SWOT analysis was used to understand NTAF's current positioning. Communications maps were used to find out whom NTAF communicate with and how this could be improved. The new brief was sense checked.

Workshop Three: Opportunity seeking, revealing initial business proposals, group discussion. The main activity of the workshop was to understand NTAF's core skills, the skills they have access to within their network and what skills they felt they needed to progress. Then, pre-developed scenarios were considered to discover the type of schools NTAF could or want to target, with an understanding of how this fits to the skills they identified, highlighting how different skills would be applied in these contexts. Finally, there was a proposal reveal and discussion to end the workshop; this was to gain feedback to steer the direction for the remaining weeks.

Workshop Four: Sense check progress, coherence and co-creation of branding and communications package aesthetics. The students gave a short presentation about the project so far. They updated the clients

on the project progress, discussing the ten business proposals and the three themes that had developed from them. The purpose of this was to gain feedback and to shape the project proposals based on these insights. The session ended with the students and organisation members, business partners and influencing bodies developing and adapting brand boards for the aesthetics of the communications package. This meant the students were able to co-create the brand outlook with NTAF.

Current CCDF & The NTAF Project

The NTAF project has been mapped to the current framework as a result of case study analysis, and semi-structured interviews with the student group (see Table 2). Again, any categories which were not addressed have been removed. Additionally, the name of one category was rephrased to better suit the project activity. Rather than 'Decrease cost', it was felt that 'Optimise functionality' was more reflective of the co-creation motive in this realm; although a decrease in cost would be a result of the optimisation, it was not the focal purpose of improving the current functioning. Again, the current framework did not seem to accommodate all co-creation motives, not covering: the learning opportunity NTAF sought through idea scoping, revising and evaluating their current offer and user value, as well as seeking out potential funding opportunities. These motives meant that 'co-value' and 'co-strategising' were additional forms of co-creation which were apparent but not encompassed in the framework. Finally, key engaging actors must be noted; these being the student project facilitators and the academics involved.

Table 2: Categories of the current CCDF which were relevant to the North Tyneside Academy Foundation Project

	Dimensions					
Categories	**Co-creation motive**	**Co-creation form**	**Engaging Actor**	**Engagement Platform**	**Level of Engagement**	**Duration of Engagement**
	Access to resources	Co-conception of ideas	Focal firm	Physical resources, spaces/events	Cognitive	Recurring
	Enhance customer experience	Co-production	Customer		Emotional	
	Create customer commitment	Co-promotion	Partner		Behavioural	
	Create more competitive offerings	Co-meaning creation	Influencer			
	~~Decrease cost~~ Optimise functionality					
	Emergent strategy					
	Build brand awareness					

Percy Hedley Foundation

Overview The Percy Hedley Foundation (PH) project aimed to explore the benefits, challenges and requirements of providing opportunities for its service users and staff to be enterprising, and develop a model for responsible enterprise that could be applied across the organisation. The mini-project spanned four weeks, with the larger research project lasting eight months. The students responded by developing three creative briefs, which focused on enterprise, stakeholders and strategy. The deliverables for each of those briefs were: a value statement, a timeline of priorities and a definition of enterprise relevant to PH. The project team used the 'Five Stages of Working' as follows: Week 1: Set-Up, Week 2: Evolution of the Problem & Solution Space and Strategy Development, Week 3: Preparing the Pitch, Week 4: Unpack. Client involvement was workshop

based, but also involved some site visits, and one feedback meeting after the closing of the project with the team leaders and the Director of Adults Services (see Figure 5).

Figure 5: Percy Hedley Foundation Project - Stakeholder Engagement. Source: AUTHOR

Engagement Activity

Site Visits to Percy Hedley Early in the design project the students undertook a series of visits and shadowing activities at PH. These activities were essential for gaining empathy and understanding about the service users, the staff and their setting. Project tutors reported a notable change in perception and a shift in project thinking as a consequence of these encounters.

Workshop one: Perspective gathering, sense checking and co-creation. Activities were arranged to find out the perspective of enterprise with the PH executive team, analyse the current process and find areas of improvement to gain an insight of the board member perspectives of enterprise; specifically, the benefits and barriers. There were a larger range of perspectives than expected (board members were not on one page); this lead to the development of the value statements. The students analysed enterprise from 3 perspectives; internal, external and holistically, then reviewed the current enterprise process, to discover the barriers and benefits and develop an insight into the communication channels within the organisation.

Workshop Two: Co-creation. This workshop had two parts. The first part of the workshop engaged a cross-section of staff and service users from the PH's different service functions. Based upon an enterprise position statement that the students had developed, the workshop facilitated creative thinking about what a PH enterprise week would look and feel like. Participants considered staff/service user/community engagements,

training, project planning and entrepreneurial ideation, market intelligence, service/product development and creation, and trade/sales and celebrations. The second part of the workshop was set up like a 'gallery', illustrating change and development to support enterprise with the themes, Foundation, People, Activities mapped out over one, three and five years. The overarching theme was culture change, people development and community engagement. The outputs and discussions from this workshop were passed from the student project to the larger ongoing research and have been used as a basis to develop a refined model of enterprise for the foundation.

Current CCDF & The Percy Hedley Project

Using the case study data, along with semi-structured interviews with the lead researcher, academics and student group the PH project was plotted onto the current CCDF (see Table 3). As the four week project with PH was a more exploratory project without a clear project outcome, many co-creation motives were highlighted. Again, there was the need to rephrase some of the categories to better fit a social innovation project of this nature. It was agreed that 'user' was a better term than customer, as PH does not necessarily have a 'customer' base, but has wide ranging user groups who benefit from PH's services. As discussed in the NTAF case study, 'Optimising functionality' was more appropriate than decreasing cost. As the project discussed was part of an eight month research project, there was an element of co-research. Additionally, the participating actors worked together to co-create value and strategy which are not co-creative forms that are apparent on the original CCDF. The engaging actors also included, the student facilitators, academics and the lead researcher.

Table 3: Categories of the current CCDF which were relevant to the Percy Hedley Foundation Project

Categories	Dimensions					
	Co-creation motive	**Co-creation form**	**Engaging Actor**	**Engagement Platform**	**Level of Engagement**	**Duration of Engagement**
	Access to resources	Co-conception of ideas	Focal firm	Physical resources, spaces/events	Cognitive	Recurring
	Enhance ~~customer~~ user experience	Co-production	Customer		Emotional	Continuous
	Create ~~customer~~ user commitment	Co-experience	Partner		Behavioural	
	Enable self-service	Co-meaning creation	Competitor			
	Create more competitive offerings		Influencer			
	~~Decrease cost~~ Optimise functionality					
	Emergent strategy					
	Build brand awareness					

FINDINGS: A DEVELOPED CO-CREATION DESIGN FRAMEWORK

The analysis and evaluation of the CCDF in light of the three case studies demonstrated that although some categories can be applied in this context, adaptations need to be made in order to best suit an educational setting with social innovation and service design projects. The original CCDF has been edited based on the case study analysis. In particular, co-creation categories have been added and rephrased to better suit an educational setting in social and service design project contexts. This is presented and discussed below, with a Developed CCDF established.

Table 4: The Developed CCDF

Key:

Newly added / Rephrased	Not covered in any case study

	Dimensions					
C a t e g o r i e s	**Co-Creation Motive**	**Co-Creation Form**	**Engaging Actor**	**Engagement Platform**	**Level of Engagement**	**Duration of Engagement**
	Access to resources	Co-conception of ideas	Focal Organisation	Digital application	Cognitive	One-off
	Enhance user experience	Co-design	User	Tool or product	Emotional	Recurring
	Create user commitment	Co-production	Supplier	Physical resources, spaces/events	Behavioural	Continuous
	Enable self-service	Co-promotion	Partner	Joint processes		
	Create more competitive offerings	Co-pricing	Competitor	Personnel groups		
	Optimise Functionality	Co-distribution	Influencer			
	Best route to market	Co-consumption	Project Facilitators			
	Emergent strategy	Co-maintenance	Industry Experts			
	Build brand awareness	Co-outsourcing	Researcher			
	Network Building	Co-disposal				
	Idea scoping	Co-experience				
	Value creation	Co-meaning creation				
	Sense Checking & Revision of current offer	Co-value				
	Learning Opportunity	Co-strategising				
		Co-scoping				

The Dimensions

Co-Creation Motive When considering the co-creation motives for the three projects, the original categories did capture most of these. All organisations approached the Masters programme because they wanted to work with the 'student engine' and academics (Access to resources), and the briefs covered the desire to 'Enhance customer experience' and 'Create customer commitment' with 'More competitive offerings', which ultimately meant that 'Brand awareness' would be created and an 'Emergent strategy' for the engagement forms would be an outcome of the projects. One point to note however is that the term 'Customer' has been changed to 'User'. The necessity for this change became particularly apparent in the PH case study, where their interactions are more experiential than transactional. This is one adaptation which expands the framework's reach outside of product development. Another adaptation has been to change 'Decrease cost' to 'Optimise functionality'. Again, this is due to the social innovation contexts of NTAF and PH case studies. Decreasing cost was a secondary aim of optimising and improving their current functionality in specified areas, and so this category was rephrased so that it was not limiting to 'cost' alone.

Along with the described adaptations, categories were also added to the original 'co-creation motive' dimension. These are: Network building, Idea scoping, Value creation, Sense Checking & Revision of current offer, and Learning opportunity. These were added after evaluating the three cases studies, and deciding upon new categories which would best fit the types of motives that were present but not accommodated in the framework currently. The description and rationale for the new categories are as follows:

Network Building refers to the organisational motive of utilising a co-creative project to help with their communication channels, allowing different internal and external parties to come together to share their perceptions and input in the future direction of the organisation. In all of the case studies, the organisations wanted to improve their external communication channels from the outset. Additionally, although it was often a by-product, arranging workshops with different members of the organisation meant that internal communication channels were also improved, which is seen as an essential element of successful co-creation (Lee, Olson & Trimi, 2012).

Idea Scoping was added due to the exploratory nature of the projects. As projects are in an educational setting with student facilitators, the purpose of the projects are not always to develop a fully refined concept. Rather, the organisations want students to explore the challenge and scope out ideas for future directions. This is evidenced in all three case studies.

Value Creation is defined as the organisational motive to redefine or evaluate their value to user groups. Whether this is an exploration of how to enhance current value, or scoping out new ways of creating value, this was a common theme across the case studies. NTAF and PH both wanted to scope out how to create new value for their users, whereas NWG wanted to consider how their engagement strategies could fit into the current organisational values.

Sense Checking & Revision of Current Offer. These motives encompass the desire to either scope out new directions and avenues for the business, or find new applications in different user groups or markets. This is most predominantly seen in the NTAF and PH studies. In the NWG case study, the organisation had already done some thinking around the project focus and the Masters 5-day project was more of a sense checking activity, to see if their thinking was appropriate and what else it could lead to.

Learning Opportunities is a motive of both the organisation and the student group. As neither party is well accustomed to co-creative activity, these types of projects provide a great opportunity to explore and learn with a smaller associated risk.

Co-Creation Form When considering the Co-Creation Form, the most interesting observation was that all forms of co-creation were cumulative in nature; meaning that co-creative activity occurred over multiple interactions and *as a result* of the interaction, rather than during a particular engagement activity. Frow et al. (2011) do identify this type of co-creative form, but only when referring to 'Co-experience' and 'Co-meaning' (as can be seen in Figure 1 above). The current study demonstrates that this type of co-creation can happen in all forms. For example, 'Co-conception of Ideas' in the NWG project; the focal organisation were only engaged on the first day ('Set-Up', with a purpose of research generation), the third day ('Strategy', a day for evolving ideas into concepts) and the fourth day ('Pitch', when concepts are presented and given constructive feedback for refinement), and so the students were unable to engage with the organisation for a particular type of co-creative activity. Rather, the time together was used to discuss concepts and ask questions so that the students were able to gain feedback and knowledge to later adapt their concepts to best-fit NWG, their values and future visions. And therefore, the Co-conception of Ideas did occur, but in a cumulative form. This can be evidenced in all three case studies, and for all co-creation forms. Thus, an adaption to "A Typology of Forms of Co-Creation" (Frow et al., 2011) is suggested to highlight that all forms of co-creation can be cumulative, especially when referring to nonlinear involvement of all actors.

Within each case study, Co-conception of ideas, Co-design, Co-production and Co-promotion, Co-experience and Co-meaning were all identified. This gives strong evidence to support the inclusion of these categories in the framework. On the other hand though, Co-pricing, Co-distribution, Co-consumption, Co-maintenance, Co-outsourcing and Co-disposal were omitted in all three cases. While this suggests that these categories are unnecessary, it does not seem appropriate to omit them from the framework all together. This would limit the framework to social innovation and service design, rather than being inclusive of those contexts and product development alike. In order to expand the scope of the framework, Co-strategising, Co-value, and Co-scoping were added.

Co-strategising was evidenced in all three cases studies and was central to the projects. The student facilitators worked on different forms of strategy in each of the projects, using the workshops to inform and develop them with the input of different actors.

Co-value. As discussed above, scoping the organisational value was central to both the NTAF and PH projects, and though it wasn't a focal point of the NWG project, the consideration of user value (via personas) was constantly referred to. Through workshop activity and discussion, the students were able to co-create value with the other actors involved during the project, most predominantly the focal organisation.

Co-scoping. This refers to the notion of jointly scoping out ideas and future directions. This is one of the main activities which occur throughout student projects, due to the exploratory and experimental nature of the educational environment. Again, all three case studies demonstrate this form of co-creation as part of the workshops, and as a cumulative activity.

Engaging Actor The engaging actor refers to any internal or external stakeholder involved during the project. This dimension was the most straightforward to adapt and supplement. The main change was rephrasing 'Focal firm', to 'Focal organisation'. This was done to accommodate the way that the 'firm' was not the lead actor; this role was shifted so that the organisation that was a focus of the project, and the facilitators were the lead. Additions to this dimension are 'Project Facilitators' (in this case, primarily the student group), and 'Industry Experts' (the academics). More generic terminology was used in order to keep the categories within the CCDF applicable to a variety of contexts, not just for educational purposes.

Engagement Platform The only platform which was addressed during any of the three projects was 'Physical resources, spaces/events'. This is one of the most notable findings of the study, that there needs to be an even more granular level of the framework which expands on the 'engagement platforms'. In particular, the case studies show that workshops (a physical resource), can be used for a multitude of activities which are co-creative either through cumulating feedback and perspectives, or facilitating a co-creative activity with the actors involved. In the PH and NTAF studies in particular, workshops are used for a variety of reasons and were central to the co-creative activity. A second outcome of the workshops being a main form of engagement is that workshops help to develop a more networked involvement. Feedback gathered from actors in the project illustrated that a networked involvement leads to more learning (from all perspectives) and a richer outcome. Therefore, there needs to be more emphasis put onto the variety of 'engaging actors' so that project leads can address it and plan for a network of actors to be involved.

Level & Duration of Engagement No adaptations were made to these dimensions. The only points to note were that cognitive and emotional engagement were the extent to which the student projects were able to cover. This is because for behavioural change, follow up research needs to be gained. Due to the nature of the study and the projects, this was not possible and so cannot be addressed. Similarly, all the organisations strived for continuous engagement from their user group but this element is not something which is recorded following the close of the projects and so cannot be discussed.

CONCLUSION

To conclude, the main findings and limitations are stated below.

1. **Cumulative or Generative:** The nature of intermittent actor engagement means that the co-creation is often cumulative over the duration of the project, rather than being particular to an activity. In some cases, generative co-creation happens at an engagement point, but only if an activity is specifically designed for the actors involved to develop ideas. More often, the students provide material for the clients to build upon, critique and give feedback to, resulting in cumulative co-creation. This, however, raises the question of whether you can truly co-create content as part of an engagement activity within such a short space of time. This is one of the main differences when making the comparison between a linear involvement of actors, with intermittent input.
2. **Exploratory motives for co-creation:** Through the evaluation of the three projects, it is clear that there are more exploratory motives for co-creation than the original framework caters for. It is not always the expectation that a refined product or service will be the outcome. Rather, the student projects are a way of asking questions, and imagining future possibilities.
3. **The framework as a tool:** The framework can be used as a planning and reflection tool: to plan with the organisation and the project facilitators what they want to achieve and learn from the project.

Following the project, it can be used to identify what was achieved, missed opportunities and where to go next. A demonstration of this was done in the current study through the retrospective analysis. This is especially relevant in this type of study as the motives of the focal organisation (basis of the project), may be different to that of the facilitators'.

4. **Framework Additions - An Even More Granular View?** There are many different types and levels of user groups, which are not accommodated by the term 'customer'; this could be something which is not always part of the framework, but changes with every project (as users are not always the same). A stakeholder mapping tool could be used to identify this group. This is similar for the engagement platform as discussed above. This calls for an even more granular view to co-creation, so that innovation opportunities in these domains are not missed.

There are limitations to the retrospective method, looking back over projects does not allow for different types of engagement to be tested out 'live'. Not hearing directly from the organisation's perspective while adapting the framework meant the authors relied on the expectations of the clients recorded at the beginning or throughout the project. Additionally, the case studies, though relevant in the context, are from one university, based on the project activity of one Masters course.

FURTHER RESEARCH

- **Intelligent Involvement:** The study starts to consider an idea of intelligent involvement that suggests that, when considering the 'Five Stages of Working', there are optimum times and reasons for engaging the client that are not always necessary, and if this is not planned for, it could result in a negative involvement. Further research here could help in the development of an intelligent strategic management tool for co-creation.
- **The Framework as a Planning, Assessment and Reflective Tool:** As discussed above, the CCDF can be more than a strategic planning tool for organisational co-creation. Future research could consider whether 'Co-creation motives' could be broken down into motives for 'the network', such as; the organisation, the students and any other key stakeholders. This is most advantageous to educational applications as it could give a greater clarity when planning and assessing. It would allow the student facilitators to plan for learning opportunities within the project in accordance with the organisational motives and desired outcomes, and then assess and reflect throughout as to whether these are being achieved.

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