

Collaborative Project Identity Formation Process in Complex Projects

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Dr Harri Haapasalo has been a Professor in Industrial Engineering and Management over 20 years at the University of Oulu, Finland. He has research interests in business management, product management and also in management of production processes. The list of publications covers more than 300 international scientific publications. He has been as chair and committee member in organizing numerous international conferences and has been as a reviewer and belongs to the editorial board for several international scientific journals. Prof. Haapasalo is a scientific director of Lean Construction Institute Finland.



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Abstract

Currently, the increase in relational project contracts and integrated project deliveries indicates that companies should collaborate to facilitate more effective project delivery in industrial projects. Collaborative project identity is considered a core concept in the evaluation of processes involved in collaborations between industrial projects. The concept implies that a single identity, one in which collaborative values, collaborative working practices and cooperation are central, is beneficial to a project organisation's self-image and can distinguish the organisation from other project organisations.

Therefore, this research aims to examine the processes involved in the formation of collaborative project identity in an industrial project. This identity cultivates a sense of joint belonging and a culture of cooperation that contributes to the success of a project. In order to acquire an in-depth understanding of this phenomenon, two projects were qualitatively researched as a case study of the processes involved in the formation of collaborative project identity in the delivery of an industrial project. More specifically, organisational documents, project materials, workshop materials, project websites and interviews were used as data collection sources.

The findings of this study revealed five steps in the formation of collaborative project identity: (1) establishing a collaborative sense of meaning and purpose; (2) establishing a sense of shared responsibility; (3) building mutual trust among all participants; (4) Establishing workforce diversity; and (5) designing appropriate collaborative project management information systems. These research results could be used to support the development and management of high-performing collaborative project teams. They could additionally assist collaborative project organisations in actualising the innovation potential of all participants collaborating in joint projects – in the best interest of the project.

Keywords: collaborative project identity, complex projects, collaborative project delivery methods

1 Introduction

One may define collaborative project identity as an identity for which collaborative values, working practices and cooperation are considered central to the project organisation's self-image, thereby distinguishing this type of project organisation from others (Walker et al., 2015; Hietajärvi and Aaltonen, 2018). The current proliferation of relational project contracts has created great potential for collaborative project delivery methods (collaborative PDMs) to foster innovations and to improve performance in the best interest of the whole project (Aapaoja et al., 2013).

A PDM is a system that integrates all project activities, such as financing, design, construction, operation and maintenance, to facilitate the delivery of a product (Miller et al., 2000; Engebo et al., 2019). Moreover, a PDM (Touran et al., 2011) consists of all of the contractual relations, roles and responsibilities of the project participants involved in the specific project. In the literature, a large number of PDMs have been outlined for use by project owners, three of which are well established: design-bid-build (DBB), design-build (DB) and construction manager-at-risk (CMR) (Chen et al., 2010; Engebo et al., 2019; Touran et al., 2011; Miller et al., 2000).

However, Miller et al. (2000) referred to these three PDMs as a single delivery method, one which is incapable of offering project owners a choice in their search for value in terms of project quality, service, technology and price. Therefore, an emerging PDM, which is currently referred to as collaborative PDMs, is needed to execute modern, complex industrial projects. Essentially, collaborative project delivery involves the sharing of resources, such as human, information, technology and technological knowhow resources, among project participants to more effectively execute a project (Kourti, 2017; Ey et al., 2014). Project participants collaborate with the intention of achieving a common objective (Engebo et al., 2019). This spirit of collaboration also allows project participants to be more committed to and act in good faith towards the successful execution of the project (Walker and Lloyd-Walker, 2015).

A wealth of current academic research has demonstrated the success of diverse types of collaborative PDMs, including integrated project delivery, project alliancing, partnering, relational contracting and relationship-based procurement. These collaborative PDMs have significantly improved project delivery and have made valuable contributions to the extant project management literature. Accordingly, collaborative PDMs have been acknowledged as appropriate methods for delivering complex industrial projects (Walker and Lloyd-Walker, 2015; Engebo et al., 2019; Lahdenperä, 2012). Nevertheless, industrial projects continue to face challenges with the social dimensions of collaboration, especially with how to cultivate a sense of joint belonging and a

culture of cooperation among collaborative project participants, which is referred as collaborative identity (Bresnen, 2009; Laan et al., 2011; Van de Ven and Ring, 2006; Hietajärvi and Aaltonen, 2018).

According to Gioia et al. (2013), the concept of identity is central to organisational success in that it provides meaning to and a deeper understanding of the who, why and what that makes one organisation stand out from others. To date, research on organisational identity has been dominated by studies of permanent organisational identity (Gioia et al., 2010, 2013; Ruitis et al., 2012; Scoit and Lane, 2000) rather than temporal organisational identity, properly known as project identity (Hietajärvi and Aaltonen, 2018; Walker and Lloyd-Walker, 2015). Consequently, research on the formation process of project identity is currently limited. One such study is that by Hietajärvi and Aaltonen (2018), who concentrated on collaborative project identity in the context of alliance project delivery. However, our research focuses on the role of identity in broader collaborative PDMs in relation to complex projects.

The concept of collaborative project identity, which originated in the identity perspective, addresses the question of ‘Who we are, what we do and why we are doing this as an organisation’. Collaborative project identity can thus provide a framework for integrating diverse project participants for the purpose of cultivating a sense of joint belonging and a culture of cooperation (Albelt and Whetten, 1985; Gioia et al., 2010, 2013; Engebo et al., 2020).

Collaboration is key to the successful implementation of complex projects. Therefore, understanding the mechanisms and processes that support the development of complex projects at the initial stage will enhance the likelihood of project success (Walker and Lloyd-Walker, 2015; Hietajärvi and Aaltonen, 2018). Collaborative project identity can be considered to have both theoretical and practical implications, particularly in industrial project settings that involve participants from diverse organisational backgrounds and for non-business organisations whose goals, values, norms, cultures and identities often conflict (Ruuska et al., 2009).

The main objective of our research was to examine the processes involved in the formation of collaborative project identity in industrial projects. Thus, comparatively, we are of the view that little is known about collaborative project identity in industrial projects or about its formation processes as a whole. In recognition of the distinctive characteristics, central purpose, values and cultures intrinsic to each project, the ways in which one project is differentiated from others and presented to stakeholders may be considered to be at the heart of any successful inter-organisational industrial project.

The abovementioned discussion can be condensed into the following research question: *How and through what kinds of processes can collaborative identity in industrial projects be formed?* This study qualitatively addresses this research question through the examination and analysis of organisational documents, project materials, workshop materials, project websites and interviews with participants at two industrial projects: a bio power plant project and a nuclear power plant project. We contend that our study effectively addressed the challenges associated with the social dimensions of collaboration, particularly how to cultivate a sense of joint belonging and a culture of cooperation among collaborative project participants in the industrial projects. As such, our research enhanced understanding of the processes involved in the formation of collaborative project identity in the context of industrial projects as well as in the formation of organisational identity more generally. Thus, our findings can contribute to broader research on collaborative and relational PDMs.

2 Theoretical Background of the Study

2.1 Collaborative Project Delivery

The proliferation of relational project contracts in recent years has created great potential for collaborative PDMs to foster innovations and to improve performance in the best interest of the whole project (Aapaoja et al., 2013). Collaborative project delivery has been the subject of extensive research in the project management literature due to its contemporary relevance and valuable contributions to modern, complex project environments (Walker and Lloyd-Walker, 2015; Lahdenperä, 2012). In its most basic sense, collaborative project delivery is simply how different project organisations come together to share resources for the execution of a specific project. Thus, alliances among different organisations are aimed at developing a single organisational structure to facilitate the successful completion of a project in which each organisation has a stake (Crooks et al., 2018; Tsaturyan and Muller, 2015; Kujala et al., 2013; Ahola et al., 2013; Engebo et al., 2019). Above all, such alliances relieve project participants of risk and uncertainty by sharing project risks but also rewards (Dietrich et al., 2010; Laura et al., 2020).

Consequently, diverse methods and approaches have been developed by both practitioners and academics for the delivery of industrial projects (Chen et al., 2012). Collaborative project delivery has the potential to improve project performance by increasing opportunities for closer integration through the early involvement of key participants, transparent financials, shared risks and rewards, joint decision-making and collaborative multiparty agreements (Lahdenperä, 2012; Rutten et al., 2009). Three forms of collaborative project delivery are currently acknowledged in the literature:

project alliancing, integrated project delivery and partnering (Lahdenperä, 2012; Walker and Lloyd-Walker, 2015).

2.2 Collaborative Project Identity in Complex Projects

Organisational identity at once poses and answers questions such as ‘Who we are, what we stand for, what lies ahead in our future, what makes us stand out from other organisations, and what we have in common’ (Albelt and Whetten, 1985). An organisation’s identity reflects the essence of what the organisation is and why it exists, as well as its strategy, values, shared beliefs, goals, mission, practices and actions (Scott and Lane, 2000; Gioia et al., 2010, 2013).

Organisation theory research has acknowledged that organisational identity, i.e. how members collectively make sense of and construct their organisation, is fundamental to an organisation’s success (Hietajärvi and Aaltonen, 2018; Gioia et al., 2013; Rutitis et al., 2012). Beyond this, however, organisational identity is also a managerial concept and a strategic tool, one that forms the core components of a well-developed organisation (Albelt and Whetten, 1985). In this sense, then, organisational identity is key to revealing the perceptions of the organisation’s members and the concepts and strategies used to structure the organisation.

Organisational identity is basically a system of claims that encompasses the totality of what an organisation aims to maintain. Thus, a clearly defined organisational identity can articulate that which is central, distinctive and enduring about the organisation to its external stakeholders (Albelt and Whetten, 1985; Gioia et al., 2013; Rutitis et al., 2012).

Most of the extant research on organisational identity (Humphreys and Brown, 2002; Gioia et al., 2013; Rutitis et al., 2012) has focused on permanent organisations (Cyert and March 1963), often overlooking temporal organisations (Bakker, 2010). Gioia et al.’s (2010) publication, ‘Forging an Identity’, provides an enlightened perspective and a grounded model comprising eight prospective processes for creating organisational identity that can serve as a framework for identity formation (Gioia et al., 2013; Hietajärvi and Aaltonen, 2018). These identity processes are as follows: articulating a vision, experiencing a meaning void, engaging in experiential contrasts, converging on a consensual identity, negotiating identity claims, attaining optimal distinctiveness, performing liminal actions and assimilating legitimising feedback (Gioia et al., 2010, 2013).

Nevertheless, as relatively few studies have explicitly focused on project identity, further research on collaborative project delivery approaches is warranted (Nyameke et al., 2020; Hietajärvi and Aaltonen, 2018; Walker and Lloyd-Walker, 2015).

Collaborative project participants work together to ensure successful project delivery. This is especially important for industrial projects, which are typically complex and involve state-of-the-art technologies that may not be easily deployed by a single organisation (Laura et al., 2020). Thus, industrial project delivery often calls for the participation and collaboration of diverse, specialised project actors to combine their competences and capabilities to achieve project goals. Despite the value of collaboration as a success factor for complex project delivery, challenges frequently arise among project participants due to their divergent identities. These divergences must be overlooked in favour of a unitary identity that can foster collaborative values, collaborative working practices and cooperation, all of which are central to the collaborative project organisation's self-image and distinguish the project from other project organisations. Thus, the fundamental and defining feature of collaborative project identity in delivering a complex project is its capacity to address that which is central, enduring and distinctive for the project organisation (Hietajärvi and Aaltonen, 2018).

2.3 Synthesis for the Emergence of Project Identity

Based on earlier research, it is clear that collaborative project identity is critical for project success. Therefore, it is evident that especially in large and complex projects, i.e. those that involve several different stakeholders, project management should operationalise collaborative project identity as an intentional management act or even as a standard method. For a joint organisation, the questions 'Who we are' and 'What we do' should be used to provide a framework for integrating project participants. Further, as a logical consequence of such integration, key project participants should share their collaborative values, collaborative working practices and rules for cooperation. However, even when such integration is successful, a collaborative project is typically temporary and tenuous, comprising individuals from different organisations who have varying roles and levels of commitment. Therefore, the integration of project participants should be done intentionally and persistently so that the project organisation is consistently and ultimately beneficial for all participants.

3. Research Methodology

This research sought to enhance understanding of the processes involved in the formation of collaborative project identity in an industrial investment project. As mentioned above, research in this area is relatively limited; therefore, an inductive case study approach coupled with a qualitative research method was employed. More precisely, our research methodology focused on the interpretation of collaborative project identity (Holme and Solvang, 1997; Miles and Huberman, 1994; Pekuri et al., 2015). We opted for the collection of qualitative data as such data can generate a rich and holistic understanding of research phenomena.

In our efforts to comprehend collaborative project identity in an industrial project, we relied on contributions from Gioia et al.'s (2010) 'Forging an Identity', including the abovementioned eight prospective processes for creating organisational identity, as well as work conducted by Hietajärvi and Aaltonen (2018) on 'the formation of a collaborative project identity in an infrastructure alliance project', which served as an inspiration for and a cognitive frame of reference in our analysis.

3.1 Case Selection

Two renowned energy projects were selected for our case study: a bio power plant project and a nuclear power plant project. These two projects were chosen because they aligned well with the scope of our study and offered an excellent opportunity to deepen our understanding of collaborative project identity in complex industrial projects. Moreover, both projects involve a complex interplay between project participants and stakeholders. Additionally, these projects permitted us to gain in-depth access to a variety of materials and information sources, thereby enabling material triangulation.

3.2 The Bio Power Plant Project (BIO)

Oulun Energia has been a pioneer in the Finnish energy industry for over a century. In addition, Oulun Energia has a dominant market role in the northern part of Finland with a business operation that entails the overall value chain of the energy sector. Thus, the company specialises in the production of raw materials, the generation and distribution of electricity, heat and steam, and the provision of smart energy services, as well as network management, subcontracting and maintenance services.

Oulun Energia provides clean energy in the form of electricity and heat for homes, businesses and communities as a whole. The company has also initiated a plan to optimise its energy production, targeting 100% carbon neutrality by the 2030s. Therefore, the company is seeking to build modern

power plants that will support both current energy technology and equipment and technology and equipment needed to reach its planned target of 100% carbon neutrality.

Oulu Energia's bio power plant (BIO), one of the case projects for this research, is located in the Laanila industrial area in Oulu. The project is intended to use the new power plant to replace an existing plant that is nearing the end of its service life. Bio power plant began development in June 2018 and is estimated to be completed in November 2020. The thermal input of the plant will be 215 megawatts, of which 75 megawatts will be generated by electricity and 175 megawatts will be created by district heating capacity. The main objective of the plant is to produce electricity and district heating, as well as to potentially process steam for the industry. The plant is a multi-fuel power plant that will utilise various fuel compositions as well as recycled fuel. The service lifespan of the plant is expected to be 40 years, and the estimated cost of the project is 200 million euros.

Figure 1 illustrates the main project companies involved in executing the power plant as well as their roles. Company 1 is the engineering consultant for the project, while Company 2 is fully responsible for all construction works on site. The boiler plant and flue gas purification are being supplied by Company 3, while Company 4 is in charge of turbine installation. Solid fuel reception, storage and conveyance is the responsibility of Company 5, whereas Company 6 is responsible for the architectural and principal design engineering.

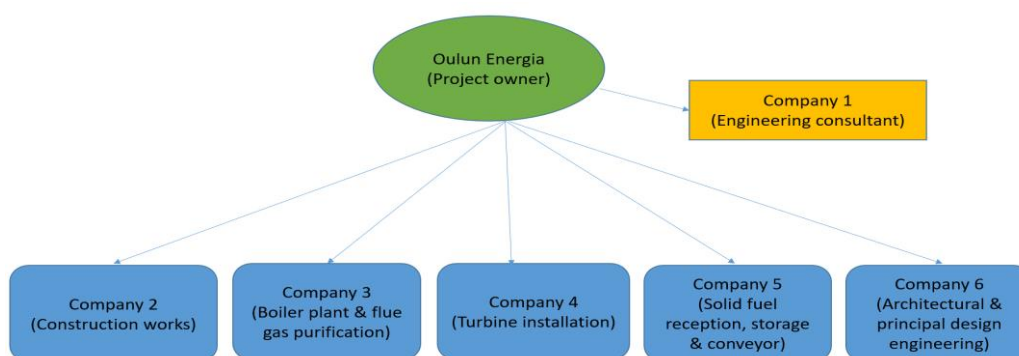


Figure 1. Design and main equipment suppliers for the BIO power plant project.

3.3 The Nuclear Power Plant Project

The nuclear power plant project is expected to be built in the northern part of Finland, in Pyhäjoki. The project is owned by Fennovoima OY (an organisation that operates mainly in the nuclear power plant industry). The plant supplier is RAOS Project Oy, which is part of the Rosatom Group, an atomic energy technologies and corporation giant. The reactor supplier is Company 3 (as referred to in Figure 2 below), while Company 2 is in charge of the civil and construction works,

such as site preparation, infrastructure works and site engineering systems, civil engineering, detailed design, construction of the reactor, turbine islands and auxiliary buildings, material and component supply, automation, and installation work. Additionally, over 100 sub-contractors are expected to be engaged in this project.

The nuclear power plant will house one Russian-designed VVER-1200 pressurised water reactor and will produce 1200 megawatts of electricity. The total investment cost of the project is estimated to be 6.7 billion euros, which includes initial plant costs, financing and waste management. The project is expected to begin in 2021 and end in 2028. Fennovoima is currently preparing design- and safety-related documentation for the Finnish Radiation and Nuclear Safety Authority to review in order for the Finnish Government to grant permission for construction. Meanwhile, Company 1 is already executing the first phase of the project, which includes offices and some residential buildings. Figure 2 also illustrates the main project participants involved in the nuclear power plant and their roles.

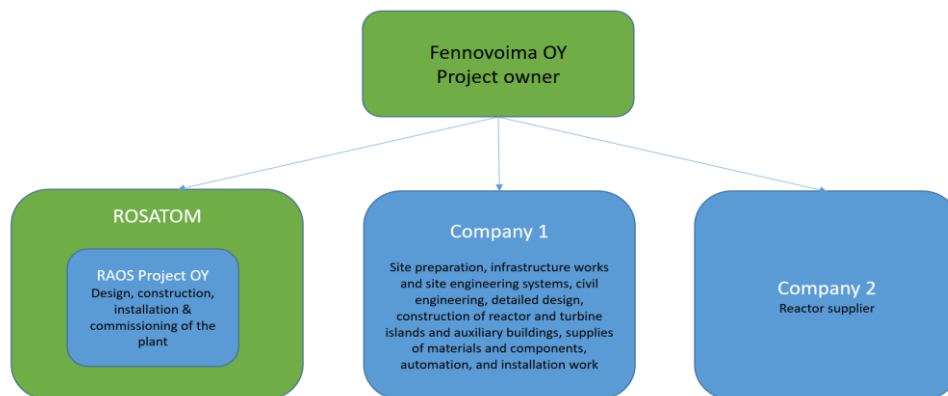


Figure 2. Design and main equipment suppliers for the Hanhikivi nuclear power plant project.

3.4 Data Collection

Semi-structured interviews were used to gather primary empirical data. In total, we interviewed 13 project executives and project managers, five from the nuclear power plant project and eight from the bio power plant project, who are at the forefront of executing the case projects. Additionally, we utilised a combination of organisational documents, project materials, workshop materials and project websites as a means of collecting additional data. The interviews, however, served as the primary source of data collection. Table 1 provides an overview of the case companies and interview details. The questionnaire (Appendix A) covered general themes related to complex projects, collaborative project delivery and collaborative project identity in the industrial complex projects.

Taylor and Bogdan (1984) captured the importance of using interviews as a means of collecting primary data; thus, the interviews served as an effective tool for documenting cases that have not yet been observed. Moreover, interviewing project participants directly with regard to a particular matter provided us with a thorough understanding of their views as well as knowledge specific to our research topic.

Most of the interviews were conducted at the project worksites, inside common rooms on the premises of each of the ongoing projects. A few, however, were conducted through Skype. The interviews were recorded digitally and then later transcribed. However, to maintain validity, the interviewer took notes during the interviews as a backup method. The tapes and notes facilitated the analysis of the researchers' gathered qualitative data.

Table 1. Overview of project participants and interviewees

Project	Date & Interview Duration	Interviewee Company's Role in the Project	Position of Interviewee	Location
Bio Power Plant	05.09.2019 45 min	Engineering consultant	Project Manager	Company's office
	03.06.2019 40 min	Construction	Project Manager	Project site
	29.05.2019 45 min	Bioler Plant & flue gas purification	Project Manager	Project site
	29.05.2019 35 min	Power Plant piping	Site Manager	Remotely
	04.06.2019 55 min	Turbine installation	Project Manager	Remotely
	17.06.2019 45 min	Owner	Design Manager, and Project Manager	Project site
	03.06.2019 40 min	Owner	Safety Manager	Project site
Nuclear Power Plant	05.06.2019	Design, construction, installation & commissioning of the plant.	Public Relation Manager	Project site
	05.06.2019 50 min	Design, construction, installation & commissioning of the plant.	Site Director	Project site
	29.05.2019 1 hour	Design, construction, installation & commissioning of the plant.	Director of project control department	Remotely
	23.05.2019 30 min	Construction	Project Manager	Project site
	23.05.2019 40 min	Construction	Site Engineer	Project site

All eight key members from the design and main equipment suppliers of the bio power plant project were interviewed. All of these interviews took place between 29 May 2019 and 5 September 2019, with an average duration of 45 minutes. All correspondents had worked with their main organisations for over 10 years, with some having worked for 30 years on different collaborative projects with other companies. Our correspondents thus possessed extensive experience in project management, and their involvement provided a great opportunity for the researchers to acquire necessary information that in turn permitted the study's research question to be answered. Every interviewee was free to answer a given question based on their respective experience, knowledge

and competence with regard to collaborative project identity in an industrial complex project. Aside from the interviews, we utilised a combination of organisational documents, project materials, workshop materials and project website information to assist in our analysis.

A total of five project participants from the design and main equipment suppliers of the nuclear power plant were interviewed during summer 2019. The average duration for each interview was about 45 minutes, and all interviews were conducted on the project work site with the exception of one, which occurred remotely. Our correspondents hold leading positions in the project, such as site director, director of project control department, project manager, public relation manager and site engineer. The interviewees each had over 15 years of experience in their individual organisations and had gained extensive experience about collaborative project delivery. Their experience provided us with an excellent opportunity to acquire the information needed to answer our study's research question.

4. Research Findings

To begin, we started the analysis by identifying the relevant themes from the interview transcripts concerning the formation of collaborative project identity in an industrial complex project. The interviews were condensed to help us identify the relevant common information and key words concerning the formation process of collaborative project identity in an industrial complex project. Table 2 lists quotes from the interviewees related to the collaborative identity formation process. The selected evidence from the condensed data was compiled to empirically investigate and crosscheck our interpretations, as well as to boost our confidence in the research findings. However, we further validated our findings by comparing and utilising the works of Hietajärvi and Aaltonen (2018) and Gioia et al. (2010). Eventually, through the analyses, five steps that affect the formation of collaborative project identity in an industrial complex project were identified.

Table 2. Illustrative quotes from all the interviewees that substantiated collaborative project identity.

Collaborative identity formation steps	Illustrative quotes from interviewees that substantiated collaborative project identity
	<i>'Getting a clear understanding of the project vision and goals among project participants is a key'.</i>

Establishing a collaborative sense of meaning and purpose	<p><i>'Parties motivation for participating in the project_ The why'.</i></p> <p><i>'One good aspect of collaboration is new technologies exposure, which boosts our capability and competence for future project delivery'.</i></p> <p><i>'We need to be sustainable, and be in business to run our organisation financially; therefore, collaborating to deliver a project that we may not be able to execute alone would help us be in business'.</i></p>
Establishing a sense of shared responsibility	<p><i>'Understanding and establishing work roles for participants, and the art of work independence'.</i></p> <p><i>'We make sure the team understands clearly the objectives and their role to play in the project, someone needs to be responsible of something'.</i></p> <p><i>'Setup key performance indicators for monitoring project success'.</i></p> <p><i>'We try to ensure a good relationship among work interdependency participants, and warmly welcome ideas from individuals'.</i></p>
Building mutual trust among all participants	<p><i>'There should be trust among project parties in order to deliver together; a good project collaboration is built on trust among participants, and commitment for the project'.</i></p> <p><i>'Project parties' capability reflects in their track records; therefore, the party records should be identified with the project objectives, whereas others can have the confident you can do the specific task'.</i></p> <p><i>'Working as one project organisation enhances trust for each other, the sense of feeling of togetherness'.</i></p>
Establishing workforce diversity	<p><i>'Diversity makes collaborative teams unique; every party feels welcome and a true sense of belonging'.</i></p> <p><i>'Project parties make meaningful impacts on the project, once they feel appreciated and value all unique perspectives and opinions'.</i></p> <p><i>'Project parties' collective experiences make the best ideas successful'.</i></p>
Designing appropriate project management information systems	<p><i>'Communication plays an important role in project collaboration, a good communication tool and techniques to deliver the information among project participants is very important'.</i></p> <p><i>'A decentralisation information system makes information easily accessible to all project stakeholders'.</i></p> <p><i>'We use information systems that are easily accessible and available for all individuals and groups'.</i></p>

By going through the empirical data gathered after the interviews, five process steps that affect the formation of collaborative identity in complex projects were identified, as shown in Figure 3 below.

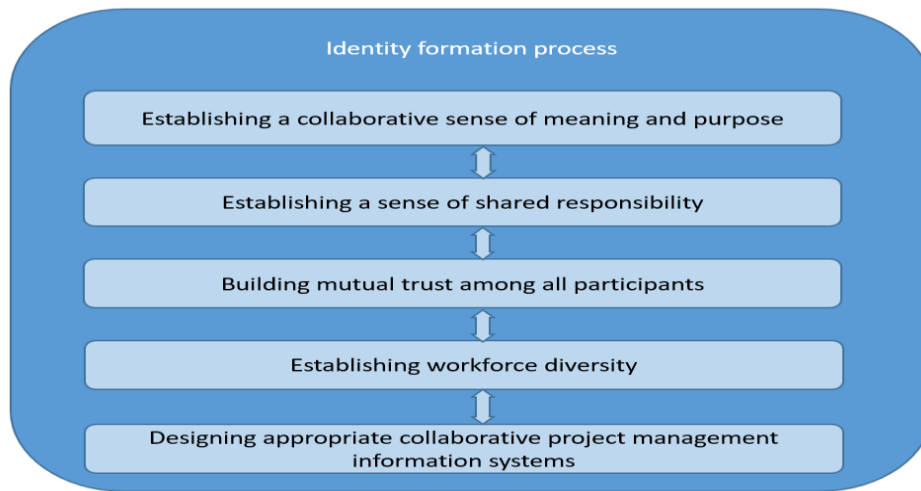


Figure 3: Collaborative identity formation process.

4.1 Establishing a Collaborative Sense of Meaning and Purpose

Establishing a sense of meaning and purpose in collaborative project delivery is thought to be central in project development processes. According to our data, collaborative delivery projects with a strong sense of meaning and purpose reduce project delivery problems. Thus, participants need to identify the meaning and purpose of the project as well as whether it falls within their core business and values. As one interviewee recalled, *‘One thing we considered first is to check if the project vision and goal aligned with our line of business, and then if we had the expertise to deliver’*.

What actually motivated participants to collaborate on a particular project was elaborated on by several interviewees. Throughout the interviews, the most common motivation for participants was money, but so too was the opportunity to be in business. Thus, reflecting on what drives participants to participate in a project plays a vital role – i.e. ‘the why’. As one interviewee commented, *‘We are involved in such collaborative projects because we want to be in business and make money. So, if due to the complexity of the project we don’t have the expertise to deliver all aspects, then it is wise to collaborate with others to get our share of the cake to run our organisation’*. According to the empirical data, some participants are attracted to projects due to their implementation of new technologies and innovations. However, when a firm does not have all that it needs to deliver a project due to a lack of expertise with new technologies, the best option is to collaborate with others who *do* have such expertise. Such collaborations can only enhance the firm’s competence and capabilities.

Through the collected data, we observed that participants or members within the project organisation take pleasure in working for the project due to its identity. Recognising the importance and significance of the project for the community instilled pride in the project participants and

boosted their reputation. As one interviewee recalled, *'It is a good feeling to participate in such an ultramodern project that has new technologies we can learn from, which will boost our competence and give us a competitive edge'*.

4.2 Establishing a Sense of Shared Responsibility

Establishing a sense of shared responsibility for collaborative project delivery was, according to our data, one of the essential features of project identity. Thus, clearly assigning tasks with the requisite details to responsible teams or organisations helps participants to identify with their mandates with regard to the project and to improve their performance. By doing so, teams know exactly what their job role is and possess the correct documentation needed to carry out their duties. About this, one interviewee remarked, *'High team performance plays an important role in a collaborative project delivery such as this. It is one of the things we thought about at the initial stage. However, we make sure the team understands clearly the objectives and their role in the project. Tasks are well articulated, and the necessary documents are provided'*. Clearly, then, outlining and providing all necessary documentation concerning job processes and responsibilities facilitates project success, which in turn strengthens each party's commitment and willingness to deliver.

Simply put, collaboration is about working collectively to achieve project success. One critical element of collaborative project delivery is that each party feels a sense of togetherness and thereby views project success as the ultimate aim of the collaboration. Project participants ensure monitoring and control systems are put in place to measure the performance of the project. As one interviewee recalled, *'We hold each other responsible for our performance; thus, whether we are performing or underperforming. In the beginning, as part of the planning, we set up key performance indicators for monitoring project success'*. According to the empirical data, key performance indicators are regarded as a highly influential factor that can affect the success of collaborative project delivery.

Although several factors can affect whether a collaborative project delivery will be successful, establishing a platform conducive to the acceptance of ideas and opinions from all individuals and participants plays a crucial role for the team. As one interviewee stated, *'In cases like this, individual ideas and opinions need to be warmly welcomed so that one doesn't feel that their opinions and ideas are being ignored by others'*.

4.3 Building Mutual Trust Among All Participants

Building mutual trust between participants in collaborative project delivery is vitally important, as it can improve each party's capabilities, strengthen the collaboration and enhance strategic flexibility. Our empirical data indicate that building mutual trust among participants is key to successful collaborative project delivery. Further, such mutual trust constitutes the foundation upon which a strong team can be built and creates a positive work culture beneficial to all collaborative project delivery participants.

Conversely, a lack of trust among project participants can incur unexpected costs to the project organisation. For example, in the absence of trust, participants might lose confidence in each other, which can in turn degrade productivity. When mutual trust exists among collaborative participants, mutual reliability and transparency naturally follow. This is not to say that establishing and sustaining such trust comes easily. Normally, trust is built over time: As participants increasingly interact in the early stages of the project, they become more familiar with each other's competencies, capabilities and behaviours, the consequence of which is the instantiation and development of mutual trust and thereby entrust in each other.

Participants build trust by getting to know each other and deepening their relationships over time. As one interviewee recalled, *'In the early stage like this, it is difficult to have that confidence or to be reliant on their integrity. However, there should be trust among project parties in order to deliver together, so what we do sometimes is to have a look at your track records, as that will give us an idea of what you're capable of doing and what you can offer in this project'*. When trust is well established, morale among participants increases, as does mutual respect; this in turn facilitates a strong collaborative team.

Our empirical data clearly demonstrate that trust is key to creating collective and individual commitment to successful collaborative project delivery. However, the gradual, time-consuming nature of the trust-building process – and corresponding confidence-building process – is problematic for temporary project teams, such as those formed during collaborative project delivery. Therefore, in such cases, identity-based trust, which is a form of trust that creates a common identity for the project, is a viable, if not essential, method for ensuring the success of collaborative project delivery. Thus, resources that promote a new, shared identity among project partners should be introduced and cultivated in such projects.

When participants feel a sense of togetherness, complications arising from fragmented identities become a non-issue. About this, one interviewee remarked, *'identifying ourselves as one entity to execute this project enhances our trust for each other and our commitment to the project. It takes away our individual*

organisational boundaries'. A shared sense of commitment among project participants strengthens their attachment to and identification with the project. That said, senior management and project managers should take the lead by exemplifying such shared commitment to the project, as doing so would almost certainly motivate their subordinates, thereby laying the groundwork for mutual trust among the project participants. In the words of one interviewee, *'I think as a project manager that there should be a "leadership by example". I need to be committed to the project and build that trust so the team will follow suit'*.

4.4 Establishing Workforce Diversity

Designing good working relations in consideration of multiple identities was another essential objective for participants in our case projects. That project participants collaborating in the case projects possessed distinct organisational identities and different work practices as well as divergent business cultures and associated identities, both national and international, required more intensive and frequent mutual communication early on so as to develop new working practices for collaborative project delivery and novel strategies for working with diverse people. As one interviewee mentioned, *'We all have a different business culture/identity, both national and internationally, so at the beginning we had more mutual communication to build this new working environment friendship, a sense of togetherness'*. At the initial stage, all project participants understood that failing to mitigate the effects of fragmented identities would likely cause havoc in the project. As such, good working relations with multiple identities had to be cultivated as early and intensively as possible.

Thus, the case companies fully engaged in inculcating collaborative means of working and communicating with participants with different organisational identities. About this, one interviewee commented, *'In my dealings as a project manager, I have realised that collaboration harnesses the potential among individuals; however, since these individuals are originally from different organisations with different organisational identities, we initially built a good working relationship, agreeing on a mutual working practice, sharing the same value for the project'*. Consequently, the collaborative project team became much more innovative and capable as the team became more diverse. In a sense, and perhaps paradoxically, establishing the art of diversity among members of the collaborative project team can actually support the formation of a single collaborative project identity. In the view of one interviewee, *'Basically, we had a lot of discussions at the initial stage to address differences among us and arrived on common ground'*.

4.5 Designing Appropriate Collaborative Project Management Information Systems

Designing appropriate project management information systems played a demonstrably vital role in collaborative project delivery per our case projects. Project management information systems are basically software applications that assist project participants and some key stakeholders, such as senior managers, managers and project teams, to track and follow the progress of the project from project conception to project completion. The appropriateness of these information systems cannot be overstated, as production efficiency depends on the right type of system. Likewise, to ensure that all project participants can track required tasks easily and provide easy access to information, the system must render the development cycle clear and transparent. Doing so provides project participants with a better understanding of the progress of the project in part and as a whole.

Our empirical data suggest that designing a decentralised information system is beneficial to the outcome of collaborative project delivery. As one interviewee recalled, *'I must say that the distribution of information plays a major role here, as the information system must be designed in such a way that all project participants have direct access to the original information, and that's what we are using for this project'*. Specifically, the case projects employed collaborative project information systems to provide pertinent information about the scheduling of resources, budget management, supplier management, time management, task assignments, quality control and project documentation. Needless to say, the wide-ranging applicability of these software systems suggest that without them, it would be nearly impossible to communicate effectively with the project organisation's functional departments or executives.

More importantly, collaborative project activities involve different organisations and functional areas that are executed by different disciplines, such as architects, engineers and sub-contractors. Moreover, although these disciplines operate interdependently, they also make their own decisions. To avoid conflicts in this regard, collaborative project information systems are used for planning, scheduling, controlling and tracking the various activities and decisions of each discipline.

One characteristic of collaborative information systems, according to our empirical data, is their simplicity and easy accessibility for project participants. As one interviewee noted, *'We try to utilise information systems that are easily accessible and available for all individuals and groups, because the information needs to travel as fast as possible'*. Therefore, introducing technological platforms intended to enhance ease of access to information for all project participants is vital to effective collaborative project delivery.

5. Discussion

The goal of this paper was to enhance understanding of the processes intrinsic to the formation of collaborative project identity with respect to inter-organisational project delivery (Hietajärvi and Aaltonen, 2018) and organisational identity formation (Gioia et al., 2010, 2013; Schultz and Hernes, 2013), as well as to contribute to broader research on collaborative and relational PDMs (Lahdenperä, 2010, 2012; Walker and Lloyd, 2015). Collaborative project identity plays a critical role in the development of relationships between project participants; moreover, it depicts the ways in which project participants organise and envision their project organisation. Ultimately, the crucial success factor for inter-organisational investment projects is effective collaboration project management (Engebo et al., 2020).

Working collaboratively to deliver a project has a demonstrably positive impact on the project organisation and has as such been highly recommended by both researchers and practitioners (Lahdenperä, 2010, 2012; Walker and Lloyd, 2015). Thus, collaborative project delivery provides a framework for successful integration among project participants (Engebo et al., 2020). However, due to the often fragmented identities of project participants, collaborative project *identity* plays a vital role as well. Thus, it is crucial to establish and cultivate a single identity for which collaborative values, collaborative working practices and cooperation are centrally situated in the project organisation's self-image and deployed to distinguish the project organisation from other such organisations.

Based on our analysis, the formation of a collaborative project identity occurs via five process steps. A collaborative project identity embodies the essence of who, why and what a collaborative project organisation is, and as such it represents the primary organising element responsible for defining what the collaborative organisation intends to achieve. However, as we have proposed, the five process steps that constitute the formation of a collaborative project identity are integral to the organisation and must therefore be adequately discussed and implemented in the project development stage.

In their study of collaborative project procurement arrangements, Walker and Lloyd (2015) elaborated on why project identity should be much more of a concern to project organisations. In their decades-long research on these organisations, Walker and Lloyd found that project participants become more motivated and involved in a project when they feel a sense of purpose directly tied to the objectives of the project. This observation precisely corresponds to our first

finding. Thus, first and foremost, the executives and key stakeholders of a project must establish a collaborative sense of meaning and purpose among project participants, one that would enable them to provide answers for foundational questions of ‘what, how and why’. Doing so would also not only motivate the project participants but also reinforce their strong sense of engagement with the project.

In their work, Aarseth et al. (2012) sought to highlight the ‘practical difficulties encountered in attempting to implement a partnering approach’. Their findings revealed that unclear roles and ambiguous responsibilities on the part of project participants represented one of the key challenges for collaborative project delivery. Arguably, our second finding confirmed that establishing a sense of shared responsibility as well as clear roles for project participants at the project development stage plays an important role in the success of collaborative organisations. This is because such actions allow the project participants to obtain a clear idea of what their involvement in the project entails. More precisely, fully comprehending one’s responsibilities and participatory roles with the aid of sufficient documentation prior to project execution can help to better prepare for and excel at the tasks required to ensure the success of the project (Aarseth et al., 2012; Engebo et al., 2019a, 2019b).

The third finding of our study foregrounded the importance of building mutual trust among all participants to ensure the success of the collaborative project delivery process. That said, typically, such trust develops gradually over time. Should it be underdeveloped or entirely absent, then the capabilities and competencies of each participant would go unnoticed – or worse, wasted. The integrality of mutual trust in collaborative project delivery and organisational identity formation is clearly evidenced by the substantial amount of scientific research and publications that have been devoted to this issue (Luo, 2002; Puusa and Tolvanen, 2006; Penteli and Sockalingam, 2005; Chen et al., 2009). We agree with such a pronounced research emphasis, and towards this end we have, in our work and as discussed in the present paper, provided practical recommendations for how project participants can build and sustain trust with each other in their practice.

Our fourth finding acknowledges the value of establishing workforce diversity. This is because the data have shown that the more diverse a workforce is, the more effective and successful the collaborative team becomes. Such diversity can manifest in various dimensions, such as organisational culture, organisational competencies, capabilities, technology and skills. Often, harnessing workforce diversity is prohibitively time-consuming and arduous. Nevertheless, it is a worthy goal to pursue insofar as it can ultimately generate a more effective and successful

collaborative project delivery. This finding conforms to those in other studies, such as that conducted by Roberson (2019).

The fifth finding identified the design of appropriate information systems for collaborative project delivery as key to the constitution of inter-organisational project identity. Foremost, the use of appropriate information systems can increase production efficiency. Additionally, decentralising such information systems can allow project participants to track required tasks more easily and can provide easier access to information, both of which are essential to collaborative project identity processes as well. This finding is in line with those generated in several other studies and as such evidences the crucial importance of designing appropriate information systems to collaborative project identity (Braglia and Frosolini, 2014; Varajao et al., 2017; Silvola et al., 2011; Ahlemann, 2009; Karim, 2011).

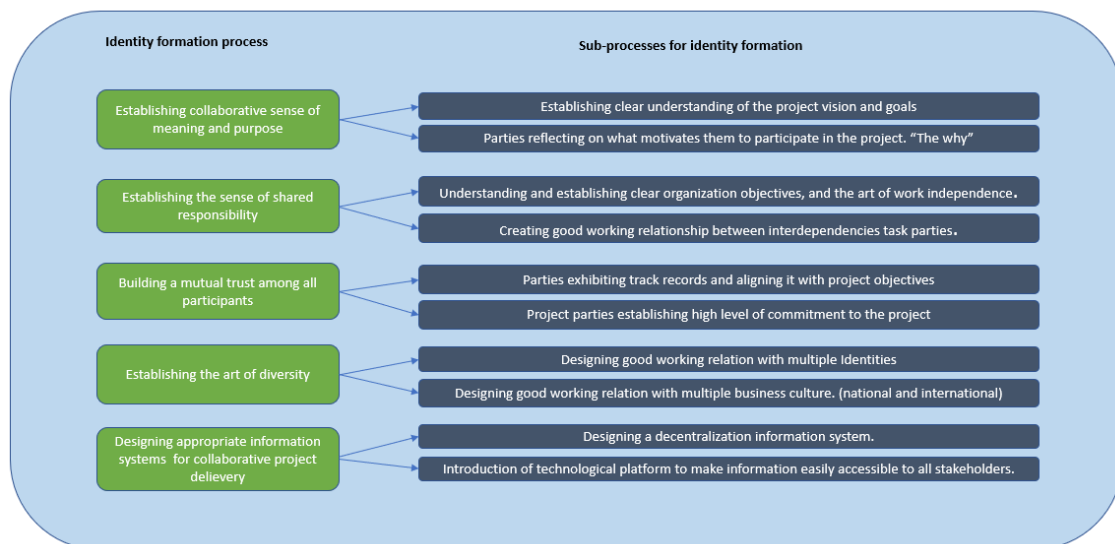


Figure 4. Process for collaborative identity formation in industrial investment projects.

6. Conclusion

The current research sought to deepen and enhance understanding of collaborative identity in the context of industrial investment projects and of collaborative project delivery at large. In our efforts to do so, we sought to answer the question: *How and through what kinds of processes can collaborative identity in industrial projects be formed?* Towards this end, two energy projects were used as a case study to conduct qualitative research on the formation processes of collaborative project identity in industrial investment project delivery. We also utilised a combination of existing literature, organisational documents, project materials, workshop materials, project websites and interviews to generate a range of data for the study.

The research identified challenges to integration among distinctive and fragmented project participants with different and conflicting organisational goals. Therefore, our research findings provide insight into the measures and processes collaborative project participants acknowledge prior and during the execution of an industrial investment project. As shown in Figure 3, our findings provided five process steps as well as sub-processes for identity formation that shed light on what collaborative project delivery participants do in practice to achieve successful project delivery.

6.1 Managerial Implications

Our findings clearly indicated the five process steps that affect collaborative identity formation as well as how the most effective project participants utilise these steps practically, especially at the development phase of the project. We are therefore of the view that our findings could guide and support the development and management of high-performing collaborative project teams. Additionally, our findings may allow companies to better commit their staff to delivering industrial investment projects. Our findings represent a wider scope of inquiry than what has been explored in prior literature, which is often limited to a specific or single collaborative delivery method. In other words, project identity can and should be intentionally formed at the very beginning of the project.

6.2 Limitations and Further Research

The empirical findings of this research were limited to two energy projects. We thus acknowledge that different industrial projects could exhibit significant differences in collaborative project delivery processes and related phenomena. Moreover, as different projects entail different identities, further research on different industrial projects could yield a clearer understanding of whether our findings have the potential for generalisation. Likewise, additional research on collaborative project identity formation processes in other collaborative industrial project contexts in which project participants possess conflicting identities could provide a clearer understanding of the extent to which collaborative identity is broadly applicable or, conversely, specific to the contexts of different projects.

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Appendix A. Interview Guide

How to Create Collaborative Project Identity in complex Projects in practice

Part I. Company introduction

1. Please, tell briefly about your own background (industry experience and position).

2. Please, tell about your company's background (for instance you core business area and your current position for this project)

Part II. Collaborative project identity

3. When did this project started and what's the estimated date for completion?

4. How many employees are working for this project?

5. How many companies are collaborating for this project, and which companies?

6. Who are the main stakeholders of this project?

7. How did it start, and how was the project vision and goals communicated to all participants before selecting the right partners?

8. Did getting the sense of understanding of the project vision helped in selecting the right partners?

9. Per your understanding, what motivate companies to collaborate for industrial investment projects? - What is their interest?

10. What are some important things one need to consider when collaborating with other companies for industrial investment projects?

11. Per your experience, what are some challenges that comes with collaborating with other companies, both local and international?

12. How do you resolve these challenges?

13. Per your experience, what attracts best talent people to work for such project and what motivate the project team to be more committed?

14. What measures do you put in place to blend the project team's relationship, due to the diversity (different company background, and culture/identity)?

15. What is your understanding per your experience about the following tools and methods for collaborative project identity?

- Negotiation of goals and articulating a vision
- Building trust
- Power management
- Communication
- Appropriate working process
- Accountability
- Building collaborative Leadership
- Membership structure
- Image building

Finally, please, your word of advice regards this study.