

HOW TO AVOID LOST BUSINESS OPPORTUNITIES BY DEVELOPING A BUSINESS MINDSET IN THE FRONT-END OF PROJECTS: THE SIGNIFICANCE OF COURAGE

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ABSTRACT: Focusing on business cases in the context of portfolio management, we investigate how to build a business mindset in the front-end of projects. By applying theory on practical knowledge, in this study, we propose an approach to create business opportunities by developing a business mindset in the front-end of projects. A main research contribution from this work is a grounded theory named Courage, which conceptually describes the significance of acting courageously to build a business mindset in projects' front-end. This study takes a grounded theory approach involving 92 companies in the upstream oil and gas industry and harnesses two types of data: data collected through 24 interviews with informants and written documents totaling 12,722 pages of text. Our findings show that a business mindset demands hands-on experiences, which increases individuals' ability to read situations and engenders the wisdom needed to make informed decisions, thereby improving individuals' ability to act in a fashion that creates business opportunities. Our findings also show that personal development with a moral element is crucial for the development of business opportunities.

Keywords: Business Case, Business Mindset, Courage, Project Front-End, Grounded Theory, Project Portfolio Management

1. Introduction

Unlike in previous years, nations cannot purchase energy in the form of oil and gas from the same number of producers. Due to globalization, the global energy market is affected when large producers are no longer available. Thus, the importance of production and delivery from other producers increases. Therefore, it has become critical to expand knowledge that aids nations in securing petroleum products (Halttunen et al., 2022). If the petroleum industry is to achieve this goal, there are areas within project development, among others, that need to be explored—namely the connection between a business mindset, business cases, and project portfolio management in the front-end of projects.

Problems with concept creation in the beginning stages of projects are common, resulting in lost business opportunities. Based on real-world cases experienced through practice, we substantiate the importance of up-to-date literature on how to develop a business mindset in the front-end of projects. The examples we provide illustrate how difficult it can be to make company decisions in the early phases of project development. The first example relates to the price of oil falling more than 5% during an afternoon, and the second relates to commercial viability.

Example 1: The oil price fell by more than 4% in one afternoon. With that, the entire previous month's rise in the oil price was also erased. According to commodity analysts, the fall is due to disappointing job data from the United States. This event influences the price and

demand for petroleum products. At the same time, strong political signals have come from Europe about the increased need for Norwegian petroleum products. While it might be considered easy to extract petroleum from the Norwegian continental shelf, both producers and their partners need to make profitability considerations before they decide whether to extract petroleum or not.

Example 2: A petroleum discovery that one company did not think was commercially viable will now be developed by another company. Even though there is great uncertainty about the degree of project success, a new project concept must be tested by the actors involved. This also implies the necessity of the same actors to reflect and decide on the value of proceeding with the initiated project from a more holistic perspective.

Both examples are inspired by events from the petroleum industry. They could just as well have been taken from other industries. When signals from society and forecasts for demand and prices for products vary greatly, some actors see possibilities for business opportunities and start to explore them, while others are more reserved. The choices project-based organizations face regarding which projects to start and which projects to stop (i.e., project portfolio management) are therefore put to great tests.

Over the past decade, there has been a growing focus on the "value" projects bring to the organizations that have commissioned them. This value justification is termed a business case, which serves to articulate the

expected benefits of a project (Aghajani et al., 2023; Appel-Meulenbroek & Danivska, 2023). According to Gupta et al. (2022)¹ and Hansen and Svejvig (2022), a business case describes the qualitative and quantitative justification for a prospect to become a project and is an essential tool for strategic decision-making at the portfolio level. As such, a business case is the basis for deciding whether there is a project in the end—that is, if the business case is not good enough, it does not end up becoming a project.

Project portfolio management is an important task in any organization embedded in a multi-project context (Aghajani et al., 2023; Gupta et al., 2022). Project portfolio management refers to the set of projects an organization carries out during a given period and the relationships between them (Appel-Meulenbroek & Danivska, 2023; Kopmann et al., 2015). While research on both business cases and project portfolio management is ongoing, gaps still exist (Gupta et al., 2022; Hansen & Svejvig, 2022; Silvius & Marnewick, 2022). One major research gap, as pointed out by Chenger and Woiceshyn (2021), Mirzaei-Paiaman et al. (2021), and Shafiee et al. (2019), concerns a business case and its relationship to the focal project concept. That is, the feasibility of a project concept must be established early on to reduce its “fuzziness” so that costs and risks can be minimized to create business opportunities. Another major gap regards the distance between methods developed for project portfolio management and the practical value of these methods as perceived by practitioners. In particular, Hansen and Svejvig (2022) describe how project portfolio management research has resulted in suggestions for methods that have proven to be insufficient and impractical in practice. Methods have been developed that do not consider dependencies between different projects (Aghajani et al., 2023), one-off decisions, and the possible weaknesses of available data (Takahashi & Takahashi, 2022). The methods discussed are typically first implemented in the front-end of projects wherein concept developers might become vulnerable to negative influences from both organizational structures (Pauna et al., 2023; Williams et al., 2019) and individual actors (Chenger & Woiceshyn, 2021). In such instances, decisions are often based on assumptions, experiences (Jerbrant & Karrbom Gustavsson, 2013; Takahashi & Takahashi, 2022), and sometimes guesswork (Samset & Christensen, 2015). The danger of such conjectures resulting from insufficient methods in project concept development might be exacerbated by a lack of available data (Pandey et al., 2021; Shafiee et al., 2019; Takahashi & Takahashi, 2022). The consequences of these weaknesses are lost business opportunities and growth.

One sector in which the risk of lost business opportunities is highly relevant is the petroleum industry. The number of energy producers is changing in the global market which can lead to new business opportunities. Correspondingly, it has become critical for the petroleum industry to expand their knowledge on what practices can secure the availability of more affordable and sustainable petroleum products (World Energy Council, 2019, 2022) since there is a developing market for such products. However, meeting globally agreed-upon goals to mitigate climate change implies substantial changes (Aghajani et al., 2023; Pauna et al., 2023; Strojny et al., 2023) to the way the global petroleum industry operates (Halttunen et al., 2022; Sletten et al., 2023).

If the petroleum industry is to achieve all of this, areas within the domain of project development need to be explored. One area within the domain of project development is business mindset. In short, business mindset concerns the understanding of possible issues, and through this understanding create business opportunities for the company. How business mindset can affect the development of business opportunities, business case and the performance of project portfolio management appears not to be explored in the literature.

Our overall research question is “*How can a business mindset be developed in the front-end of projects?*”. Specifically, we consider this question within the context of business case development and project portfolio management. We profiled 92 petroleum companies to answer our overall research question. Using a classic grounded theory approach (Timonen et al., 2018), we performed in-depth interviews with business and project concept development professionals and analyzed official front-end department notes, presentations, applications for funding in predefined areas, and petroleum production license relinquishment reports on the Norwegian continental shelf (Table 2). We then express our research results in a grounded theory.

2. Theoretical Framework A Business Mindset in the Context of Business Case Development and Project Portfolio Management in the Front-End of Projects

The core of a business mindset is understanding that everything around us is the result of someone having an idea (Lee & Ostwald, 2022; Mell et al., 2022) and then putting that idea into practice through some sort of activity (Jensen et al., 2016). Many scholars have explored how value is created for customers, partners, and other stakeholders through various activities (Hansen and Svejvig (2022); Nevstad et al. (2022); Skålen et al. (2022); and Aarseth (2014), but the focus of this prior research has

been on the use of firm-level resources and capabilities (Skålen et al., 2022). Thus, our starting point is to expand the business mindset concept to include any activity that goes on in an organization (Zakrzewska et al., 2022), including, for example, business case development and project portfolio management. Namely, we propose that organizations need to establish a mindset that fosters nascent idea generation (Gupta et al., 2022; Jaskyte & Liedtka, 2022; Lee & Ostwald, 2022) to enable the detection of challenges and then view these challenges as potential opportunities. Value creation (Silvius & Marnewick, 2022; Zerjav, 2021) will increase if one is able to rework the opportunities into business (Gupta et al., 2022; Tang et al., 2021). We define this concept as having a business mindset. The formal justification for a business venture is provided in a business case.

A business case explains the rationale behind a decided-upon investment in an organization (Appel-Meulenbroek & Danivska, 2023) and is used to acquire management's commitment and endorsement for further project development (Dzhengiz et al., 2023; Gupta et al., 2022). Traditionally, a business case is used to articulate the expected benefits from a project (Courrent & Omri, 2022; Einhorn et al., 2022; Rode et al., 2022) and how these benefits will be measured (Akporiaye, 2023; Badewi, 2016). It is also typically used to illustrate project value (Asadabadi, 2022; Dzhengiz et al., 2023), project feasibility, recommended project concepts, relevant facts, critical issues (Musawir et al., 2017), costs (Strojny et al., 2023), time frame (Holgeid et al., 2021), resource prioritization (Akporiaye, 2023), and data needed for decision-making. According to Kopmann et al. (2015), practitioners feel confident that using business cases to inform others and make investment decisions helps create value from investments. As explained below, one of the primary tasks of project portfolio management is to maximize the value of investments, and business cases serve to convey the rationale for assessing the contributions (i.e., the value) of individual projects.

In all industries, projects have become more important than they were in the past, and as a result, the task of managing project portfolios has become a more formidable undertaking (Aghajani et al., 2023; Silvius & Marnewick, 2022). In addition, projects require sizeable portions of organizations' joint knowledge creation (Nisula et al., 2022), budgets, and strategic development efforts (Hansen & Svejvig, 2022; Rode et al., 2022). Accordingly, organizations implement a variety of project portfolio management approaches to maximize the contributions of projects and to achieve their goals (Han et al., 2023; Saiz et al., 2022). Project portfolio management

also involves pausing or adjusting projects (Rode et al., 2022). While the strategic importance of project portfolio management is well documented (Han et al., 2023; Silvius & Marnewick, 2022), research has revealed that a frequent problem with existing theory is it fails to take into account existing work structures and the mindset of the people in organizations (Hansen & Svejvig, 2022; Saiz et al., 2022). Another challenge with current theory on project portfolio management is its lack of practical applicability (Aghajani et al., 2023; Clegg et al., 2018; Kaufmann et al., 2021).

According to Hansen and Svejvig (2022), changes in the organizational environment and uncertainty have begun (from year 2010) to affect organizations and how they function (Silvius & Marnewick, 2022; Takahashi & Takahashi, 2022). One major cause of these changes is the increasing level of globalization (Hansen & Svejvig, 2022). As such, the ability of entire organizations to manage and adapt to constant changes (Han et al., 2023; Leiringer & Zhang, 2021) and to prepare for the future must be considered as part of their project portfolio management (Aghajani et al., 2023; Hansen & Svejvig, 2022). Consequently, it will be crucial for organizations to have a business mindset when developing business cases and project portfolios in the front-end of projects. However, what do we mean when we say the “front-end of a project”? While the literature contends there is no clear answer to this question (Edkins, 2013), at its core, this concept can be understood as the initial phases of a project (Takahashi & Takahashi, 2022), in which the “gathering of user, system, business, and other requirements ending in the ‘formal’ acceptance by the sponsor and the team of these requirements” (Edkins, 2013) takes place. Others (e.g. Williams et al., 2019) argue that the notions of front-end and project must be connected in the definition. This opens up other insights. An example of this definition for the front-end of a project is beginning with the approval to use any resources needed to define and prepare a project (Rode et al., 2022; Takahashi & Takahashi, 2022). Although the front-end concept is closely connected to the goals and success of both organizations (Hetemi et al., 2020; Martinsuo & Gerdali, 2020; Pauna et al., 2023) and projects (Denicol, 2022; Derakhshan & Turner, 2022; Urton & Murray, 2021), little has been written on this topic (Williams et al., 2019). Thus, in our research, we follow Edkins et al. (2013) and define the front-end of a project as the “*preliminary emergence phase(s) of a project.*”

Research Gaps

We identified four main gaps in the literature through our literature review. The first gap concerns business cases

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and their relationship to the chosen project concepts in the front-end of projects (Chenger & Woiceshyn, 2021; Mirzaei-Paiaman et al., 2021). The second regards the distance between developed methods for project portfolio management and the practical value of these methods as perceived by practitioners (Hansen & Svejvig, 2022). Third, there is only limited evidence on how business cases are used at the portfolio level (Hansen & Svejvig, 2022; Kopmann et al., 2015). Fourth, existing theory fails to fully account for existing work structures and people's mindset in organizations as they relate to project portfolio management (Hansen & Svejvig, 2022; Saiz et al., 2022). Altogether, we know little about how to connect, in practice, project concepts, business cases, and project portfolio management in the front-end of projects. As a result, we know little about how to develop a business mindset in the front-end of projects. In this article, we address the fourth gap—namely, how the mindset of people in an organization affects the development of business cases and project portfolios—by explaining how organizations can develop a business mindset that can be an enabler for projects' business cases in the context of project portfolio management in the front-end of projects.

3. Methodology

In this section, we detail the underpinnings of the approach we chose for our project.

Design

The industry under study (petroleum) is changing rapidly with respect to activity levels, profitability, and involved actors, so the grounds for and the nature of empirical data collection will confront this reality in the coming years (Castillo et al., 2022; Chen et al., 2022; Halttunen et al., 2022). A grounded theory approach is well suited to capture such developments due to its structured data collection and analysis. That is, data collection and data analysis are conjoined (Shepherd & Suddaby, 2017), and each process is in turn systematically developed to form rigorous and thorough foundations for the emerging theory.

A grounded theory approach is beneficial in that it seeks to develop theories that function in practice. This type of qualitative research emphasizes exploring individual experiences (Walsh et al., 2015), describing the focal phenomenon, and developing a theory (Rynes & Gephart Jr, 2004). In other words, it is a methodology that emphasizes the practical usefulness of theories about the communities and individuals under study. Grounded theories are judged in terms of whether they “fit,” “work” (Timonen et al., 2018), and “grab” (Walsh et al., 2015). Regarding “fit,” a theory should suit the setting

from which it was derived and be clearly developed from the data collected about it (Shepherd & Suddaby, 2017). Further, according to Walsh et al. (2015), a theory should also “work” and “grab” in the sense of enhancing participants' (in our case, front-end developers' [Section 3.3]) respective practice and insights. In addition, a grounded theory should be modifiable if new findings arise (Timonen et al., 2018).

In a grounded theory approach, the data steer the course of the study. However, it is important to note, though, that the grounded theory approach does not reject the use of established theories (Glaser, 1992; 1994; 1998; Glaser & Strauss, 1967) and that “grounded theory is not an excuse to ignore the literature” (Suddaby, 2006). For instance, many projects taking this approach use previous literature to locate their “starting points for building analysis to produce a grounded theory” (e.g. Burga et al., 2022; Magano et al., 2021). These starting points are termed “sensitizing concepts” (Blumer, 1954). Such concepts are not intended to determine what researchers will see in their empirical material but instead “suggest directions along which to look” (Bowen, 2006). Our project applies two well-established theoretical frameworks as sensitizing concepts, “community of practice” (Lave & Wenger, 1991) and “groupthink,” (Janis, 1982). Specifically, we used these sensitizing concepts to supplement the interview guide applied in the first interviews. As our project progressed to the point of gathering empirical data, these concepts directed our “gaze” toward fruitful avenues of exploration, but this was their only role in this study. That is, their value diminished and disappeared throughout the “initial phases” of the study. As such, they did not constitute a considerable part of the final theory. Personal knowledge, assumptions, and language also affect researchers' sensibility (van den Hoonaard, 1997), something we, as researchers, were aware of made and sure of that they were grounded in the data (Glaser & Strauss, 1967).

We conducted constant comparison and selective coding to progress down the path from raw data to concepts to substantive theory (i.e., “a theoretical interpretation or explanation of a delimited problem in a particular area” (Glaser & Strauss, 1967) (Figure 2). We did this to achieve theoretical completeness (higher-level concepts)—that is, to explain as much of the variation in the “problem” (avoid lost business opportunities) with as few variables as possible, thus resulting in theoretical parsimony (Bryant, 2017) and a conceptual account of how to build a business mindset in the front-end of projects in the context of business case development and project portfolio management.

Area Under Research: Norwegian Petroleum Industry—Front-End of Projects

Neither international nor Norwegian petroleum activities are exempted from the issues described in Section 2. Consequently, when making decisions, relevant individuals need to consider uncertainty, risk, and opportunities that, in turn, involve major parts of the focal organization (Derakhshan & Turner, 2022; Stordy et al., 2021). This consideration applies to both companies and owners (henceforth “players”) and front-end developers'. The investment costs in projects in this industry vary from €100 million to €10 billion or more. Thus, if actors fail to adequately describe business cases and manage their project portfolios, this can mean that their companies lose out.

Sources, Informants, and Selection

Our study harnesses two types of data. One type is data collected through 24 interviews with informants (Table 1). These informants included employees in front-end departments in the industry (concept developers) whose work entails the creation of new concepts. We also included employees working to answer strategic business development questions

(business developers) related to the cases we studied. We refer to both concept and business developers as “front-end developers.” We recruited these informants by contacting exploration, development, and production companies through the researchers' professional networks. All informants signed a formal consent form according to the guidelines of the Norwegian Agency for Shared Services in Education and Research (2021), and we ensured the anonymity of our informants. We received confirmation and permission to perform our research from senior managers in the companies. The second type of data is written documents (Table 2, Document Types 1 and 2), in total 12,722 pages of text. This is data of different genres and content from the companies' concept development departments. These data provide insights into tasks related to project concept development, business case and project portfolio development, and decision-making and knowledge-sharing in projects. Using professional (non-academic) documents (Table 2, Document Type 3) was valuable for developing interview questions and bridging the gap between practice and academic theory (Bryman, 2016).

Table 1. Interview and participant details

ID (no.)	Data used for generating theory					Data used for validating fit and grab		Area of perspective (geographically)
	Time of data collection (year)	Role in the front-end ¹	Experience (years)	Interview duration (minutes)	Interview (No.)	Time of empirical check ² (year)	Empirical check duration ² (minutes)	
1	2021	CD	40	90	1	2023	60	Norway
2	2021	BD	24	180	3	2023	60	Norway
3	2022	CD	23	30	1	-	-	Norway
4	2022	CD	25	60	1	-	-	Norway
5	2022	BD	25	80	1	-	-	Norway
6	2022	CD	20	60	1	-	-	Norway
7	2022	CD	32	80	2	2023	90	Norway
8	2022	CD	20	50	1	-	-	Norway
9	2022	BD	41	70	1	-	-	Global
10	2022	BD	30	60	1	-	-	Norway
11	2022	BD	30	60	1	-	-	Norway
12	2023	CD	25	60	1	-	-	Norway
13	2023	CD	25	60	1	-	-	Norway
14	2023	CD	25	60	1	-	-	Global
15	2023	CD	11	60	1	-	-	Norway
16	2023	BD	27	60	1	-	-	Norway
17	2023	CD	35	60	1	-	-	Norway
18	2023	CD	43	90	1	-	-	Global
19	2023	CD	33	90	1	-	-	Global
20	2023	CD	25	90	1	-	-	Global
21	2023	CD	27	90	1	-	-	Global
22	2023	CD	10	60	1	-	-	Global
23	2023	CD	22	90	1	-	-	Global
24	2023	CD	17	60	1	-	-	Norway
25	-	BD	15	-	-	2023	60	Norway
26	-	CD	32	-	-	2023	60	Norway
27	-	CD	20	-	-	2023	60	Global
28	-	BD	10	-	-	2023	60	Norway

Note: 1. See Section 3.3 for details: CD = concept developer, BD = business developer, 2 See Section 3.5

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We connected both the informants and the written documents to a specific set of projects under development. These projects refer to factual issues

within the upstream petroleum industry and thus provide relevant and updated data on what is happening in the industry.

Table 2. Details of documents analyzed

Document type (no.)	Document (Title)	Document classification (Type)	Volume (No.)	Pages (No.)	Companies (No.)
1	Norwegian Continental Shelf, relinquishment report ¹ (Issued Jan. 1, 2021 to Mar. 3, 2023)	Public	294	8,824	92
2	Norwegian Continental Shelf, applications for awards in predefined areas ² (Issued Jan. 20, 2014 to Sep. 12, 2022)	Company and Norwegian Petroleum Directorate	76	3,589	20
3	Norwegian Continental Shelf, front-end department notes and presentations (including business cases) (Issued May 26, 2021 to Nov. 9, 2022)	Company internal	9	309	15

Notes: 1. Norwegian Petroleum Directorate (2021b), 2 Norwegian Petroleum Directorate (2021a)

Data Collection, Organization, and Analysis

Data collection was performed within a specific context but with a wide assignment (Suddaby, 2006). This approach allowed us to chart a course for our investigation from the outset while remaining open what the data would tell us.

As proposed by Foley et al. (2021), we conducted all interviews as a conversation between the interviewer and the informant, allowing them to unfold in a spontaneous fashion as the questions were open enough (commonly known as “semi-structured (Rubin & Rubin, 2005) to give room for the informants to relate their personal experiences (Glaser & Strauss, 1967). We adjusted the order of the questions during the interviews depending on the informants’ responses and their lines of thinking. Further, we transcribed all the interviews immediately after they were conducted, including data that we did not see the immediate relevance of at the time of the interview but became significant later in the analysis. This part of the data collection was conducted from 2021 to 2023 (Table 1) and generated 233 single-spaced pages of text.

The initial analysis step began at the time of the data collection and continued throughout the investigation. We accomplished this step through a process of “open coding”—the initial stage of constant comparative analysis before the codes are broken down into core categories and their properties (i.e., “selective coding”). (Open coding comes to an end when it yields core categories.). In this first step, we developed both “substantive” (in vivo words pulled from the data from written memos) and “theoretical codes” (the ways in which the substantive codes and the data

they represent are related). We stopped this process when we reached theoretical saturation (Figure 2). Our written exposition of the theory was based upon the coded data and memos.

Throughout the process, we wrote memos consisting of inquiries, potential connections, and methodical queries. While, like all memos, ours were ideational, they were “sparked” by the data and, in this way, were grounded. We then linked the memos together, always grounded in the data and enriched by the conceptual schemes of the analysis, and the sorted memos provided the organization for the “manuscript” of our theory.

As the study progressed, we used the constant comparative method to continuously determine what data needed to be collected to develop the theory further (Conlon et al., 2015). Consequently, the types of data collected later in the process shaped the emergent theory.

In the final stage of the analysis, called theoretical coding, we described possible connections between the codes, leading to the formulation of the theory developed to explain our phenomenon of interest and to answer our research question (Bryant, 2021; Glaser, 1992). In our study, one part of this formulation involved combining core categories (Glaser, 1992, 1998).

Figure 1 illustrates how we organized our data through the processes of open and selective coding. It also shows the number of items coded and the number of coding references. Figure 2 provides an overview of the various steps in our research process. To organize and support both open and selective coding, we used NVivo R1.7 (QSR, 2022) as the qualitative analysis tool.

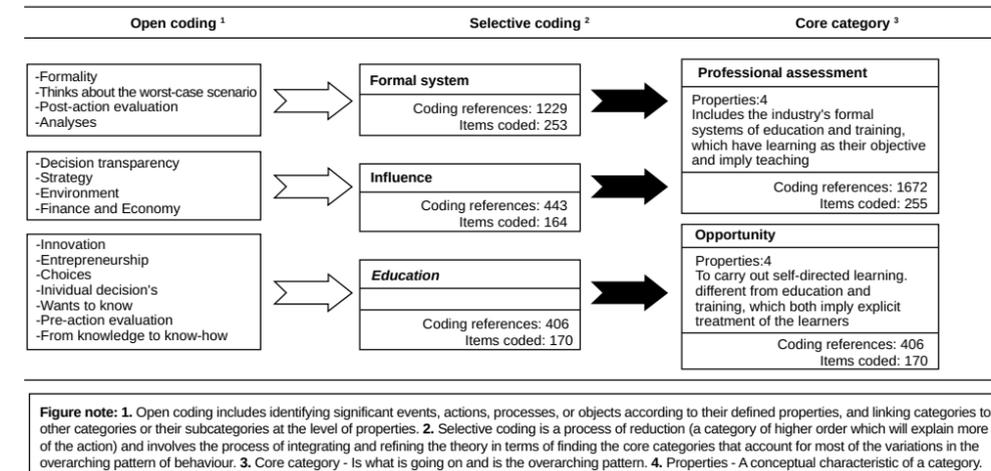


Figure 1. Data structure—organizing and analyzing the data

The theory we developed is based on memos, and we made every effort to substantiate this theory with elements from our data. The theory continued to emerge from the data in the writing process, just as it did in the analysis. The written theory presented in Section 4 is an integration of our findings, our own discussion, and points from existing theory.

Method Assessment

To meet the requirements for both “fit” and “grab” (discussed earlier), as an empirical check, we chose to use a sample of the informants from the interviews used for generating theory and to supplement this sample with other similar informants (Table 1). For the empirical check, we presented the developed theory to the informants and asked them to reflect on its content and relevance.

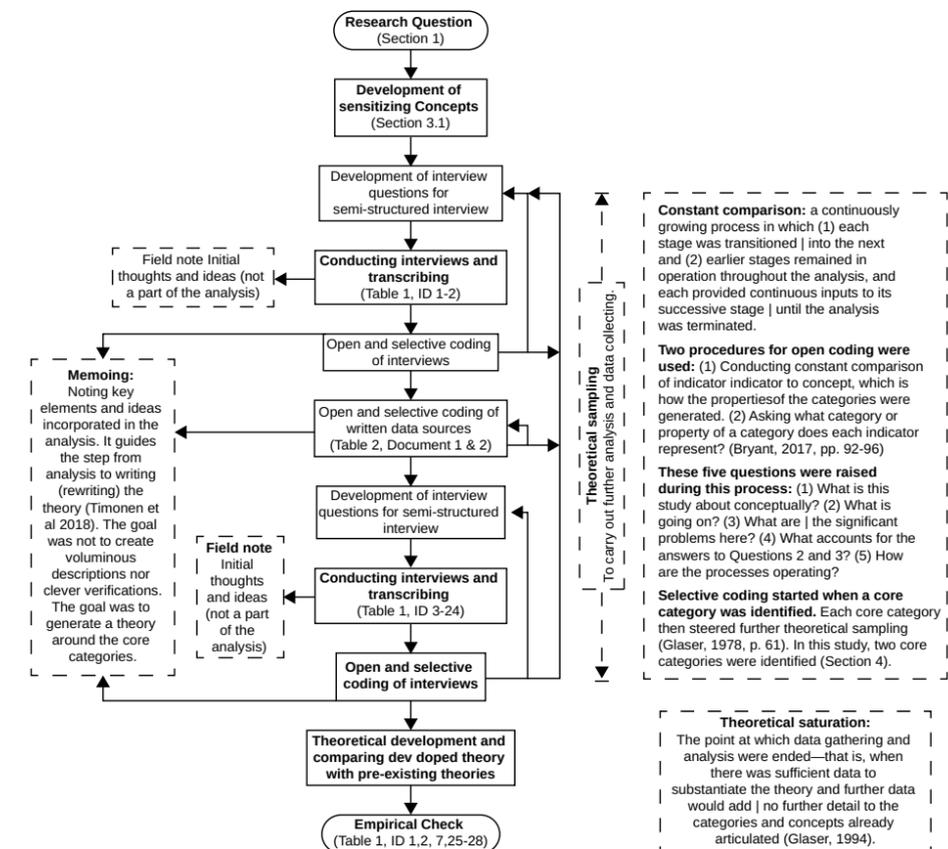


Figure 2. Schematic plan of the research process

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Credibility

None of the informants (empirical check) found a need to change the theory (see Section 3.5). In fact, they all stated that they recognized the descriptions given. They also believe that the theory will be useful for developing a business mindset in the front-end of projects and that it will contribute to advancing the current practice of developing project concepts. Because the informants see the theory as relevant and appropriate and are interested in the outcome and its significance, we believe our theory fulfills the requirements for both “fit” and “grab.”

Moreover, we hope our theory is increasingly tested so it continues to grow. In this regard, it is important to remember that while a theory does not represent all of reality (Shepherd & Suddaby, 2017), it can still be an aid to understanding reality. In the same way, Courage must be understood as a starting point. As Glaser and Strauss (1967) describe, one can use existing theory like other data to develop a grounded theory, and secondary literature can also be incorporated into the theory itself. According to Glaser (1998), when building a grounded theory, scholars must relate their theorizing to existing specialist literature to avoid losing links to theory developed by others. When developing this paper’s grounded theory (Courage), we incorporated existing theory into the theory itself. In this way, we forged a link between Courage and existing research. As Bryant (2017, 2021) argues for developing a grounded theory, we found it important to describe the theoretical situation of Courage from a conceptual level instead of focusing on details.

4. Findings and Discussion

From our data, we identified *professional assessment* and *opportunity* as the core categories influencing a business mindset in the front-end of projects. The main conceptual characteristic of the professional assessment core category is the industry’s formal systems for education and training, which have learning as their objective and imply teaching. Included in professional assessment is, influence, which constitutes the ability to influence the formation of a business mindset in the front-end of projects. To carry out self-directed learning different from education and training which both imply explicit treatment of the learners. Examples of these core categories are provided in Table 3 and Table 4.

In what follows, we discuss the two core categories (Section 4.1—4.3), *professional assessment and opportunity*, and highlight how we have answered the study’s research questions—*how can a business*

mindset be developed in the front-end of projects—in the context of business case development and project portfolio management. The results from our research are expressed as Courage, which increases the ability to read situations and the wisdom to make the right decisions, thereby improving the ability to act in a fashion that creates business opportunities (Section 4.4).

Core Category: Professional Assessment, Subcategory: Formal Systems

Under the professional assessment core category, the subcategory *formal systems* (Figure 1) constitutes an established dominant notion within the industry and the existing literature (e.g. Project Management Institute, 2021). This notion holds that challenges in projects (e.g., business case and project portfolio development) can be overcome using official databases, standards, procedures, and rules. However, our findings indicate that actual practice in the front-end of projects is somewhat different from the notion established in the literature. Specifically, we found that front-end developers must rely on their intuition as much as they do on procedures. In the front-end of projects, both simple and complex issues must be solved throughout every step of development (e.g., business case and project portfolio development). While there are many cases in which front-end developers think their knowledge is good enough, other times, they intuitively feel something is amiss, and they doubt their results. Our interviewees reported that they must learn and develop the ability to neutralize the discrepancy between their confidence in their own knowledge and their trust in the quality of results. One of the informants explained,

We are constantly working with more demanding issues, and at the same time we feel that details are of decisive importance for choosing the overall concept and the individual’s ‘professional minimum’ can be challenged. With repeated trials, doubts arise—do I have the knowledge that the situation requires?

This discrepancy can be interpreted in terms of pre-existing literature—for example, the concept of “discrepancy experience” (Rode et al., 2022). Briefly, this experience refers to recognizing the difference between what one has previously learned and seeing new opportunities. This necessity occurs at the same stage we also noticed this discrepancy. Furthermore, although they do not use the word “discrepancy,” Nisula et al. (2022) and Schein (2019) write that the distance between “what we know” and “what we do not know” creates a culture wherein the members of a team become mutually beneficial by defining

common goals, sharing knowledge, and developing new knowledge (Bailey et al., 2022) that is adapted to the specific context. Consequently, the knowledge used to explain practice cannot solely be theoretical, and the knowledge (action) developed should not only be regarded as applied theory (Lorenz & Morison, 2019). In this study, when looking for a path to develop a business mindset in the front-end of projects, we turned to the idea of practical knowledge, which is created for the immediate situation at hand, as proposed by Castellani et al. (2021) and Nisula et al. (2022).

A frequent point made by the informants and described throughout the interviews is that information relevant to the selection of project concepts in official databases can be faulty. For example, a database might contain documents that miss mark-ups, leading to a misconstrual of the challenge to be solved. The informants pointed out that experts on a subject might provide them with equally incorrect information. According to existing literature (e.g. Buengeler et al., 2021; Mirzaei-Paiaman et al., 2021), most front-end project developers recognize which subject matter experts provide precise information and then apply this information. Thus, they have acquired experiences, insights, and knowledge that allow them to make correct decisions in terms identifying and choosing the best systems and solutions for the focal purpose and project concept under development (Babaei et al., 2021; van Meeteren et al., 2022).

Through trial and error, critical testing (Nachbagauer, 2022) and (well-intended) guidance, the front-end developer understand that it is their own understanding that is the limitation. From an informant, “it’s a lot about identity building but also just as much about developing critical experience and thinking”. Both Castellani et al. (2021) and Meløe (1992) highlight that it is people who experience, observe, interpret, and try to create meaning from what they see, who are truly involved in practice. Thus, the participants in the front-end of projects bear the experience of their companies’ challenges, opportunities, and limitations that may exist in the front-end of projects. One informant explains, “Neither the experts’ nor our knowledge is necessarily good or the right; It is therefore important for us to examine the knowledge more closely in order to improve it.”, from another informant “The practical knowledge must not be seen as true or false—in project development knowledge is bad or good, the most important thing is therefore to examine it and then improve it—often we then find some undiscovered possibilities. “With such a starting point, it will also be these participants who first notice when there is “danger afoot” (e.g., missing

and/or bad data). It is understandable that companies want to minimize risk when developing project concepts, but as the informants noted, rules must be applied sensibly to avoid lost opportunities. In this way, we find a basis for explaining practical knowledge as one does not limit this knowledge to understanding the mere purpose of actions but puts knowledge in the context of the activity in which the actions take place. Through the informants’ descriptions, we know that, “people can observe a situation without learning from it and I see that knowledge can survive completely unaffected by completely unnecessary and unwanted consequences.”, or in other words, they may not carry an experience with them and they necessarily do not learn from their experiences in the front-end of projects. The aforementioned situation means that unwanted and suboptimal knowledge can be developed.

Thus, to create practical knowledge to develop a business mindset in the front-end of a project, those working in the front-end need to have an overview and understanding of what is happening in the project as well as know that they are doing. To solve new issues and overcome familiar challenges, these workers must be open to further learning and have a questioning and exploratory attitude regarding what is happening (Nachbagauer, 2022). Paradoxically, they can achieve this openness and attitude by recognizing that they are in fact unable to fully perceive what is happening. If this state of mind is mastered, front-end workers can enhance their knowledge. The opposite occurs if participants in the front-end of a project feel unwarranted confidence that they understand what is happening without suspecting they are part of an activity that they do not fully understand in reality. The reasons can be many. The prevailing perceptions of knowledge may be a reason. It may be about a lack of interest in or suitability for the work, but in many cases it is about a lack of time to reflect on complex decisions (e.g. “we like to start new tasks before the previous one is finished. —Time is too precious for us to rest”). This time is a prerequisite for the front-end developer to be able to learn from experience, not least to learn from the mistakes that are made.

Core Category: Professional Assessment, Subcategory: Influence

The subcategory *influence* (Figure 1) constitutes the ability to influence the formation of a business mindset in the front-end of projects. The findings for this subcategory indicate that when developing project concepts, business cases, and project portfolios, the

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total contribution of all professions and roles involved in the front-end (Williams et al., 2019) is greater than any single contribution from a profession. On the other hand, the outcome is not guaranteed to be the most optimal solution for the players involved. One possible explanation for this situation may be that front-end developers and the other professions involved in a project (Williams et al., 2019) largely work in parallel, and all of their contributions together constitute the total project concept and business case. For example, the following emerged in a conversation with an informant about how to achieve cooperation between different professions to solve a challenge: “Through an expanded understanding of communication to include communication, we can probably better understand the learning and development of employees to a greater extent.” Although it sounds nonsensical that “communication be included in communication”, the informant is trying to express her view that one should make a better effort to understand another profession’s point of view (Nachbagauer, 2022). The meaning of this quote is not unique. Isolated individual contributions do not build ready-made well-functioning project concepts, nor do they contribute to expanding the understanding of the individuals who produce them. A negative consequence of such isolated contributions is that the professionals who create them in the front-end do not expand their understanding, and in this way, their external understanding of and insights into the scope of other professions remains limited.

Equally important to work together in a team is that there are objects or aspects of a project under development that are wholly or partially beyond the comprehensible reach of a single profession or scientific discipline (Curhan et al., 2021). (e.g., developing overall technical barrier strategies for complicated chemical production systems requires concept developers, chemists and process engineers to work together). In the same way Wang et al. (2022) describe professionals’ experiences, our informants told us that during their creative work, they notice that some phenomena lie outside the established boundaries of their disciplines. An informant describes, “After several unsuccessful attempts to develop the ... project we understood that we as process engineers did not have the prerequisites to understand the physicists’ descriptions”. Nakata and Hwang (2020) explain this situation in terms of how the knowledge and research of individual professions or scientific disciplines focus on phenomena within established professional boundaries, and in this way, the associated

actual and potential knowledge are bounded to the focal profession or discipline. Of course, expanding the boundaries of a profession to include everything is not a practical solution to these limitations. Consequently, no professional knows everything that it is possible and relevant to know within his or her own field or discipline and certainly not outside of it.

Further, we identified that a strong professional identity may have negative consequences for the quality of work performed in the front-end of a project (e.g. “Regardless of the approach we chose, we were unable to convince ... and ... that the actual conditions did not allow such a solution as proposed - it seemed that they did not want to understand - the development of the project went in the wrong direction”). Indeed, under some circumstances, early-stage interdisciplinary collaboration may pose a threat to participants. For example, Curhan et al. (2021) demonstrate that such a threat might arise when specialists find that their specialty is viewed in a negative light. In contrast, in more genuine collaboration, participants are likely to expand their knowledge base and thus their skill level (e.g., through project alliances (Nevstad, 2022) and network capabilities (Anser et al., 2021). Why is this so? One of the informants explained,

There is some overlap between the professions’ subject areas, but through collaborative teamwork and decision-making, I see that through professional actions, I am not only informed by my own profession’s knowledge base but that I am also influenced by the relevant knowledge of the other professions that is beyond the reach of my own profession.

Furthermore, these workers are generally motivated to take an extraordinary effort to develop competitive project concepts as the best possible business cases and strong performance show their specialties in a positive light. In changing times, such effort is even more important. For this reason, Hertz (2021) encourages individuals to redefine their roles in the societies they are a part of. She argues that individuals should move from being an observer to becoming a participant, from being a consumer to becoming a citizen, and from being a recipient of support to becoming an active contributor. The participants in the front-end of projects seem to take this approach to heart. Precisely because a professional identity motivates specialists to demonstrate the value of their domain to others, it often also stimulates them to perform to the best of their ability in multi-disciplinary teams. In fact, the whole purpose of interdisciplinary collaboration is for specialists to pool their knowledge to solve complex

challenges involving multiple domains (Nicolini et al., 2022). In this way, interdisciplinary collaboration is like a tangle that needs to be unraveled (Einhorn et al., 2020), and each specialist has unique input required to achieve the task. Being able to contribute to such complex cases with their unique expertise (knowledge gained by actually doing) often makes participants in the front-end of projects even more proud to belong to their own specialty (as described by Williams et al. (2019).

Consequently, if the common goal of those working at the front-end of projects is to create competitive project concepts and do what is best for their business cases and project portfolios, then professional collaboration—both individually and collectively—among all those involved (as described by Williams et al. (2019) is a requirement. As a result, genuinely collaborative professionals will expand their own knowledge base. Because the fundamental achievement of a profession is measured by the ability to achieve goals and interprofessional collaboration increases any profession’s chance of achieving such goals, collaboration between or involving two or more professions or professionals should also be valued and encouraged by all the professions involved.

Core Category: Opportunity, Subcategory: Education

The subcategory *education* (Figure 1) constitutes front-end developers’ determination but also their attainment of the skills required to create the opportunity for a business mindset in the front-end of projects. The findings for this category show that *education* is an important part of the development of skilled employees in the front-end of projects, but it is also a challenge. According to our informants, there are regular discussions on how work processes can be standardized and made more efficient in their companies. The current approach to achieving this goal (which is also often the only available option) is streamlining front-end workers’ education and development and the industry’s overall work processes.

However, we observed that such streamlining can pose a threat to individuals’ capacity to devote the necessary time for open reflection, as embodied in the socio-philosophical and educational tradition (known as *bildung* in German-speaking and Scandinavian countries (Horlacher, 2016)) (Gadamer, 1960/2012). While the German term *bildung* has no direct translation (Duit, 2015; Fischler, 2015; Nassar, 2022), one definition from the literature states, “In essence it refers to the inner development of [an] individual, a process of fulfilment through education and knowledge, in essence a secular search for perfection, representing progress

and refinement both in knowledge and in moral terms, and amalgam of wisdom and self-realisation” (Watson, 2011).

As we interpret the philosopher John Dewey (1916/2011) is he using *education* in English for discussing experience and its relation to a true learning. According to Dewey’s definition, *education* is an experience that is subject to constant change along with the changing pattern of life. In other words, *education* can be seen as a continuous process of adjustment (Dewey, 1916/2011, 1938/2008; Fischler, 2015). Consequently, individuals need to continually adjust and readjust themselves to their environments. This phenomenon does not refer to a mechanism for pursuing preproduced information aimed at the fixed and final goal of gaining an education but instead refers to “developing a circuit of activities” (Hildebrand, 2021, Section 5.1). Its primary purpose is to transform the sensibility and judgement of those who work in the front-end of projects (through both autonomy and responsible citizenship) (Fischler, 2015; Willbergh, 2015) so they question the status quo (or established truths) as agents of the most optimal project concepts, business cases, and project portfolios.

We understand Dewey’s notion of *education* as self-directed learning, which is different from education and training, such as mentoring (Harvard Business Review, 2022), coaching (Muthuswamy, 2023; Passarelli et al., 2022), and specialized business courses (Wagner et al., 2021), all of which involve influencing the participants. Education and training have learning as their objective (Dewey, 1934/2005, 1938/2008; Roselius & Meyer, 2018), and they suggest teaching. However, *education* is an open process, not a product. It focuses on personal development with a moral element. Education and training, by contrast, focus on the content to be learned.

In other words, for participants in the front-end of projects, the practice is not only about reproducing knowledge but also acquiring a personal, reflective, and critical relationship *with* knowledge. This personal acquisition is *education*, which means that individuals eventually become able to justify the validity or invalidity of knowledge (Nassar, 2022; Roselius & Meyer, 2018) in situations where it is relevant or required to do so and can enter discussions in which knowledge is questioned. Participants who have *education* must therefore be open to seeing the context in which their knowledge is utilized. This is where practical knowledge comes into play (Einhorn et al., 2022).

In the context of front-end project development, practical knowledge is any knowledge a professional front-end developer provides. This knowledge enables the front-end developer to respond (well or badly) to the challenges presented at any given time. This means that this knowledge must be integrated into the person. Indeed, practical knowledge constitutes the ability to respond, the ability to relate—in words but also in action—to tasks requiring attention and effort (Einhorn et al., 2022). However, this knowledge may not always be “good” or “correct.” Individuals often need to reflect on their practical knowledge critically because it needs to be improved regularly. Professional front-end developers must develop and refine their practical knowledge—that is, their “ability to respond” (Einhorn et al., 2022)—so they can manage practical situations in which they have responsibilities. In turn, they will be shaped as professionals. In other words, they undergo the process of *education*, which enables them to function in practice. However, this process often receives too little attention in front-end developers’ training.

Such education and knowledge development must take place together with the streamlining mentality described above. The goal should be for those who work in the front-end of projects to not only adapt to existing practices but also contribute through their own free will to further developing regulations, the industry’s work processes, technical aspects of project concepts, and the practices in the front-end of projects.

As both theory (Roselius & Meyer, 2018) and empirical evidence show, a business mindset is not only about creating meaning through one’s participation in the front-end of projects but also about building structures whereby everyone’s opinion carries equal weight. Wenger (1998) explains this balance by saying that it is about relating one’s own opinions to those of others. In this way, front-end developers need to have the opportunity and skills to negotiate so they can effectively contribute their practical knowledge. Conversely, if the possibility to negotiate is not present, opportunities to further develop the business that take place in the front-end of projects will be limited. In other words, negotiation is about developing the ability/skill to respond in situations where one is challenged. If this skill is acquired, participants can negotiate meaning and deeper understanding (Dewey, 1934/2005, 1938/2008) that enables challenges to be turned into fully developed project concepts (Ang et al., 2021; Barendsen et al., 2021; Marnewick & Marnewick, 2022; Nachbagauer, 2021), thereby imparting value to projects.

The ability to respond is achieved through practice (Dewey, 1938/2008). That is, to develop the ability to respond, workers need support from their colleagues and challenges that are adapted to their skillsets (Nachbagauer, 2021). These challenges are strongly tied to *education*. Both the ability to respond and the acquisition of practical knowledge require *education*, and workers will not be successful in their own practice if they are not rooted in their own education.

Writing the Theory

Based our study investigating prerequisites for a business mindset (Section 5), we developed a theory and named it *Courage*. The name is motivated by several findings indicating that the ability to act courageously (Phillips, 2004) (or in other words acting with bravery [Homiak, 2019; Peterson & Seligman, 2004]) is a virtue (Kelley et al., 2019; Ratchford et al., 2023; Sekerka et al., 2009). Findings also show that acting courageously imply the ability to handle difficulties and to make informed decisions based on previous experiences as a basis for subsequent decision making and action.

We found that front-end developers to a larger extent must rely on their intuition as much as they do on procedures. To learn and develop the ability to neutralize the discrepancy between their confidence, their own knowledge and their trust in the quality of results, calls for *Courage*, which in turn will contribute to a business mindset. Recognizing the difference between what one has previously learned and seeing new opportunities becomes of importance just as much as developing critical experience and thinking. Finding undiscovered possibilities, continuously be willing to improve knowledge and apply rules sensibly, is at the heart of developing a business mindset in projects. All of these require *Courage*. To accept and involve interdisciplinary collaboration which may pose a threat to participants, also demands for *Courage*. Since front-end developers recognize which subject matter experts provide precise information, they should rely on their own intuition and show courage. These workers are highly motivated to take an extraordinary effort to develop competitive project concepts as the best possible business cases. Achievement of a profession is measured by the ability to achieve goals, but also by attainment of the skills required to create the opportunity for a business mindset. To believe in evolving opportunities, and believe in oneself to take the right decisions, require *Courage*. To attain a personal, reflective and critical relationship with knowledge, and to respond well to the challenges presented at any given

time, also demands for *Courage*. In short, when you have a business mindset, *Courage* is of essence, you intuitively recognize what is at stake in a given situation. Next you must have the courage to promote an idea generation that enables the discovery of challenges and then view these challenges as potential opportunities (Section 2.1).

In short, our findings show that a business mindset demands hands-on experiences, which increases individuals’ ability to read situations and engenders the wisdom needed to make informed decisions, thereby improving individuals’ ability to act in a fashion that creates business opportunities. The findings also show that personal development with a moral element is crucial for the development of business opportunities.

It is individuals who can make opportunities if they have been given the opportunity to develop a business mindset. Although an organization’s formal systems (i.e., its instructions and procedures) are important for the business taking place in front-end of projects, one cannot trust that they alone will solve a complicated situation. Front-end developers must be able to trust themselves. Therefore, individuals must be challenged if they want to improve their practice, exemplified by front-end developers’ feelings when something unexpected occurs. When experienced, the feeling of being part of the unexpected cannot be explained or coherently described. Official rules and theoretical descriptions have clear limitations and must necessarily stop somewhere because they cannot describe all imaginable and unimaginable situations that front-end developers come across. In order to make a difference, a front-end developer must be given the opportunity to influence the project concept that is being developed, and it is equally important for a front-end to open up to new knowledge, and knowledge outside their own professional field. In this way, interdisciplinary collaboration is like a tangle that needs to be unravelled, and each specialist has unique input required to achieve the task. At a certain point, front-end developers will enter a situation in which they are required to act, and by using courage, they can resolve the situation for the good of all those involved.

To develop and improve a business mindset, front-end developers must be able to notice when their existing knowledge is failing in practice and, on that basis, work to improve it. Otherwise, they will be paralyzed in practical situations. These workers can seek counsel from theories, procedures, and guidelines, but they can easily become unreflective practitioners by taking this approach alone. They may then fail completely

because they cannot face the new and unexpected. Accordingly, front-end developers need to embrace moving between the known and the unknown.

Players in the petroleum industry expect front-end developers to see any given event in a larger context. However, such a view cannot be achieved any other way than through practice, experience, and reflection. Taking such a view requires front-end developers to have presence, sincere interest, and courage to place themselves “in harm’s way” between the known and the unknown. Not least, colleagues’ and other players’ feedback and critical remarks are important contributors to enabling front-end developers to recognize when their knowledge is failing. Front-end developers’ previous experiences then lay the foundation for them to then enter the unknown when improvisation is required to meet expectations. Old connections dissolve and new ones arise in and through this form process. The same process makes project concept development interesting and contrasts the traditions of professional fields which emphasizes the use of more formal approaches. Project front-end development becomes an important part of and contributor to business development. It is more the front-end developer’s own professional field that is challenged.

Front-end developers can prepare for future challenges in their daily practice. Namely, through their own practice, these workers can lay the foundations to meet the players’ expectations when faced with new challenges to be solved. By routinely completing simpler and more routine tasks, front-end developer can nurture their ability to trust themselves and build a business mindset to accomplish what is needed for the situation at hand.

Learning from experience is often something that is seen as obvious, so it can become easy not to learn anything because people take practical knowledge for granted. For this reason, it is important to emphasize the significance of experience in the practical development of project concepts in the front-end of projects. Front-end developers need to be exposed to situations wherein they must open up to the immediate experience so the uniqueness of the situation becomes visible, and they can place that situation in a larger context. By understanding the bigger picture, they can then develop project concepts that support optimal business cases and contribute to project portfolio management. Consequently, front-end developers need to open up to new experiences so they can master their business mindset in relation to new expectations in an increasingly complex and regulated society.

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In terms of professional assessment, our study indicates that this topic must be further developed in relation to analysis methods and levels of formalism. Our findings show that, at present, professional assessment approaches can benefit from being modernized to fit our complex and regulated society. With respect to the opportunity to influence the ongoing development, front-end developers must be put in situations where they can influence the development of the practice taking place. Employees must also be allowed to try and fail, and they must be given the opportunity to influence how they want to learn and develop their own practice.

When it comes to theoretical and practical implications, our study shows that moving from knowledge to expertise and knowing in action (in the front-end of a project) is a fuzzy area in need of further focus. As such in further research, we will continue our theory development for *Courage* with a special focus on this area.

5. Conclusions

This study's main contribution is *Courage*—toward understanding how to build a business mindset in the front-end of projects. In this theory, *professional assessment* and *opportunity* are the two core categories influencing how a business mindset can be nurtured in the front-end development of projects in the upstream petroleum industry (Section 4). *Courage* is linked to harnessing experiences (Ratchford et al., 2023) to learn, being hands on, having the ability to read situations, having the wisdom to make the right decisions, and acting (Kelley et al., 2019; Sekerka et al., 2009) as to create business opportunities. Included in *Courage* are two subcategories of *professional assessment*: (1) *formal systems* constitutes an established dominant notion within the industry and the existing literature (Section 4.1), (2) *influence* constitutes the ability to influence the formation of a business mindset in the front-end of projects (Section 4.2). *Opportunity* also has a subcategory which is *education*. *Education* constitutes front-end developers' determination but also their attainment of the skills required to create the opportunity for a business mindset in the front-end of projects (Section 4.3).

6. Theoretical and Practical Implications

By applying theory on practical knowledge, in this study, we proposed a new approach to create business opportunities by developing a business mindset in the front-end of projects (Section 2.1). Previous studies have mainly emphasized the roles in the front-end of projects (Edkins, 2013; Williams et al., 2019), particularly those of managerial and external actors. In this study, we examine the role

of those who develop concepts in the “early formative ‘front-end’ stages of a project” (Edkins, 2013)—namely, front-end developers—in the context of business case development and project portfolio management. We build on this work to show that practical knowledge (Castellani et al., 2021; Lorenz & Morison, 2019; Meløe, 1992) and education (Dewey, 1938/2008; Fischler, 2015; Hildebrand, 2021; Nassar, 2022; Willbergh, 2015) in the front-end of projects are crucial to building a business mindset and avoiding lost business opportunities and thus also contribute to project success. The current research provides empirical evidence on the relationship between professional assessment and opportunity within project front-end development and explores the process of concept development with a new theoretical perspective.

Our theory for developing a business mindset is grounded in the substantive world of front-end developers, and as such, it fits their situation. It addresses real-life problems in project front-end development related to business cases and project portfolios. The theory gives front-end developers insights into ways they can gain some measure of control over the situations they find themselves in, and it addresses problems in a language that is understandable to those involved in this work. The theory is based on a wide variety of front-end developers' experiences from a number of companies in the upstream petroleum industry. However, it is a theory of process, so its applicability is not confined to the participants of the study but can be applied to the wider world of project front-end development.

7. Future Research Directions

Project front-end development is a challenging and demanding task. More knowledge and structure and better methods and organization of the front-end are called for. Even though this investigation is based on data obtained from the petroleum industry, the findings are also relevant within other settings. Not least, developing business opportunities applies to the need for determination and skills as part of front-end developers' business mindset—that is, the need for *Courage*. We encourage researchers to further investigate the implications of this study in different industries by replicating the research in different sectors.

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HOW TO AVOID LOST BUSINESS OPPORTUNITIES BY DEVELOPING A BUSINESS MINDSET IN THE FRONT-END OF PROJECTS

Appendix

Table 3. Examples for the core category of professional assessment

Open coding ¹	Data [Example]	Data [Type]
Formality	<i>The formal systems, typically databases, sometimes contribute to polarization as uncertainty and weaknesses become visible. On the other hand, the systems contribute to security and direction when difficult decisions must be made.</i>	Interview ²
Thinks about the worst-case scenario	<i>The exploration well would be classified as a world-class challenge.</i>	Document ³
Post-action evaluation	<i>Based on the negative results in the two exploration wells and as the remaining prospectivity in the license is considered immature, the partnership has agreed to fully relinquish the license.</i>	Document ³
Analysis	<i>Special studies included in the evaluation of the prospectivity in the license include . . . FIS module 3&4, Ichron (Cretaceous Stratigraphy), Robertson study and the C&C Reservoir database.</i>	Document ³
Decision transparency	<i>Norwegian and UK partners have had a good cooperation, and it was full agreement on the technical evaluation.</i>	Document ³
Strategy	<i>Developing the business model is part of the business strategy—the approach to the business case and the project portfolio is more unclear.</i>	Interview ²
Environment	<i>And subsequent energy consumption to produce the gas is expected to leave an unacceptably large CO2 footprint (>14kg / boe) for a development.</i>	Document ³
Finance and economy	<i>Technical and economical evaluation of . . . has illustrated that the identified prospectivity in . . . does not meet the commercial viability criterion and a unanimous decision to drop the license has been taken by the partnership.</i>	Interview ²

Notes: 1. Includes identifying significant events, actions, processes, or objects according to their defined properties and linking categories to other categories or their subcategories at the level of properties. 2. Table 1. 3. Table 2, Document Type 1.

Table 4. Examples for the core category of Opportunity

Open coding ¹	Data [Example]	Data [Type ^{4,5}]
Innovation	<i>The company has worked extensively with worldwide analogues both offshore and onshore, other industries (e.g., tunnelling business, nuclear and geothermal energy), and research institutions to better understand the reservoir properties of a fractured basement.</i>	Document ³
Entrepreneurship	<i>We must also seek to understand why the regulations are designed as they are. A deeper understanding is often necessary—curiosity, passion, and courage are essential if one is to succeed in developing viable business cases and project portfolios.</i>	Interview ²
Choices	<i>We get “whipped” when we are not more engaged even though there is a . . . chance of demonstrating opportunities—then we have no real choice.</i>	Interview ²
Individual decisions	<i>Due to a lack of support . . . [we] decided to acquire . . . to de-risk charge within the area.</i>	Interview ²
Wants to know what is going on	<i>There are several issues . . . that there has not really been a need to evaluate. It is about continuous and informal learning. That is the important thing. We see that even if . . . [we] had done a lot of work in advance, we had not considered all the details either. We were perhaps too loyal to some. We should say no. It took some time to mature our own positions before we could take matters into our own hands. We had a need to develop.</i>	Interview ²
Pre-action evaluation	<i>The work performed has greatly improved the understanding of the area to the east of the . . .</i>	Interview ²
From knowledge to expertise	<i>Pre-drill studies . . . were performed to minimize the risk of this ultra-complex prospect. The well was a record well on the Norwegian continental shelf. . . . No injuries.</i>	Document ³

Notes: 1. Includes identifying significant events, actions, processes, or objects according to their defined properties and linking categories to other categories or their subcategories at the level of properties. 2. Table 1. 3. Table 2, Document Type 1.

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