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To cite this article: Taija Puolitaival, Kalle Kähkönen & Linda Kestle (2022): The framing of construction management responsibilities in job advertisements in the UK and the USA, *Construction Management and Economics*, DOI: [10.1080/01446193.2022.2156569](https://doi.org/10.1080/01446193.2022.2156569)

To link to this article: <https://doi.org/10.1080/01446193.2022.2156569>




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Published online: 15 Dec 2022.



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The framing of construction management responsibilities in job advertisements in the UK and the USA

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ABSTRACT

Responsibilities in construction management can be looked at from many perspectives: individually and organizationally, within the organization and outside the organization. They spread from the daily tasks of a site manager to contractual responsibilities of a whole organization forming a wide and complex topic. The aim of this research was to enhance the understanding of construction management responsibilities by looking at how job advertisements frame the responsibilities of construction management professionals. A documentary research approach with genre and content analyses was used to analyze a selection of job advertisements from large main contractors in the UK and the USA qualitatively. The genre analysis revealed that job advertisements present the construction management responsibilities through a breakdown of three levels: the role name, the overview of the work functions and the description of the responsibilities. The qualitative content analysis resulted in a redeveloped definition of construction management and typology of responsibilities. Recommendations are given for job advertisement writers to ensure that the role name, overview of the work functions and description of the responsibilities all align and contain an appropriate amount of accurate information to attract suitable candidates to apply.

ARTICLE HISTORY

Received 8 June 2021
Accepted 5 December 2022

KEYWORDS



Responsibility; role; construction management; main contractor; job advertisements; qualitative content analysis; genre analysis

Introduction

There are several definitions and many views on the term “responsibility” (Jacob 2015). There is the employee perspective- where the employee is taking on the responsibilities and is responsible to the employer, and the employer perspective – where the employer is overseeing the employee in their particular role. Responsibilities can also be looked at from the perspective of related or associated parties and how one party perceives other parties’ responsibilities (Arditi and Alavipour 2019). Corporate and social responsibility beyond individual responsibilities have been discussed by many (Lantos 2001, Banerjee 2008, Kovács 2008, Latapí Agudelo *et al.* 2019).

The context of this research is construction management, and the scope is building construction, as differentiated from infrastructure construction and facilities management. More specifically the scope is the main contractors in building construction, as the employer of construction management professionals. Arditi and Ongkasuwan (2009) argued that there is

some confusion about what construction management really is. Harty and Leiringer (2017) stated that “there might not be a clear-cut definition of the term construction management” (p. 393). As an indication of this confusion, numerous definitions of construction management exist, some more applicable for the scope of this study than others. The definitions vary from some quite basic and narrowly focused, such as Fryer *et al.* (2004) who defined construction management as planning, organizing, directing and controlling tasks on a construction project. There are more extensive and diverse definitions, such as the Chartered Institute of Building (2010) definition, including the management of the development, conservation, and improvement of the built environment in society as a whole. Voordijk (2009) highlighted the multidisciplinary nature of construction management by listing project management, information technology, operations, law, economics, accounting and finance, human resource management, as well as strategy and organization disciplines contributing to construction management. A definition by Puolitaival

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et al. (2019) “Construction management addresses the forecasting and planning, organizing, communicating, coordinating, monitoring, and controlling functions required to manage time, cost, quality, health, safety, security and environmental aspects of a construction project” (p. 4) was found to be suitable to the context and scope of the research as the definition addresses construction management from the main contractor point of view and is relatively current also including environment as a more recent focus for construction management.

In construction management individual roles and the related responsibilities have been studied by Gluch (2009), Aulin and Capone (2010), and Sommerville *et al.* (2010) to name a few. There are also studies, which have looked responsibilities wider than just within one role, such as Hughes and Murdoch (2001) and Arditi and Ongkasuwan (2009) studying the legal responsibilities of project parties. The employers’ perspective on their employees’ responsibilities is, however, rarely presented in the literature. Job advertisements offer an insight into this perspective by providing a description of the role and the responsibilities (Rafaeli and Oliver 1998).

The aim of this study is to enhance the understanding of construction management responsibilities by looking at how job advertisements frame the responsibilities of construction management professionals. The article proceeds as follows. The concepts of responsibility and role are presented first, drawing attention to the many interpretations of the terms and arriving at the adopted definitions. The theoretical frame is then extended from these general definitions to construction management-specific research on responsibilities and roles and also identifying some gaps in the existing knowledge. As job advertisements are at the center of the research as the data, their nature is also discussed before describing the research methodology in detail. The results of the genre and qualitative content analysis, how job advertisements frame the responsibilities and how they define construction management, are presented and the connection with the theoretical frame is discussed identifying also the limitations of the study. The article concludes with implications for the theory and practice.

Responsibility and role as concepts

Responsibility as a concept has existed in the Germanic and Romance languages since the 17th century, referring to “being trustworthy or capable of fulfilling

obligations” (McKeon 1957 cited Schlenker *et al.* 1994, p. 632). Multiple terms such as accountability, answerability, causality, liability and duties have been linked with the term responsibility, sometimes used even as synonyms (Goodin 1986, Schlenker *et al.* 1994, Duff 2005, Brees and Martinko 2015), making it difficult to define what responsibility is and to differentiate it from these other terms. Although this research is not trying to define these related terms, some discussion is required to understand, that at the terminology level, literature does not agree on what the term responsibility means and therefore studies on responsibilities are not necessarily comparable as they might have a different understanding of “responsibility”. This discussion is also required to understand better how responsibility is defined for the purposes of this study.

Schlenker *et al.* (1994) noted that the term responsibility originates from the term accountability in ancient Greek philosophy and saw the two as synonyms. Brees and Martinko (2015) argued that responsibility and accountability are different concepts as, “being held responsible for a behavior or outcome, is different from being held accountable for it” (p. 444). While Schlenker *et al.* (1994) saw causality and answerability as the two perspectives of responsibility, Brees and Martinko (2015) linked causality with responsibility and answerability with accountability. Duties are sometimes used as synonyms for responsibilities (Lantos 2001, Arditi and Ongkasuwan 2009). However, Goodin (1986) saw duties dictating actions, and responsibilities dictating results. Liability is seen as a legal or contractual responsibility, most often between organizations, where in addition to the accountability there is also the possibility of a sanction (Cornock, 2011). There is an abundance of organizational studies such as Lantos (2001), Kovács (2008) and Lindgreen and Swaen (2010), discussing organizations’ social responsibility, which includes environmental, ethical, legal and moral aspects. To assist in understanding these connections, the multiple aspects and overall to understand the term responsibility better, Jacob (2015) introduced six forms of responsibility: role/task, legal/ethical, moral, causal, judged and felt responsibility. Jacob (2015) argued also that a single, all-purpose definition of responsibility is prone to lead to confusion. As this research is focused on looking at what the construction management professionals are expected to do in their roles, the role/task form of responsibility, “attached to particular tasks assigned to, or carried out by, people” by Jacob (2015, p. 34), was seen as being applicable.

Role and responsibility are often mapped together or not clearly differentiated, as in studies by Hartnett *et al.* (2019), on scope of work, roles and responsibilities for academic librarians, Dabrowska and Podmetina (2018), on roles and responsibilities of open innovation specialists, and Hendry *et al.* (2010), on project management roles in construction. Merton (1949 cited Swan *et al.* 2016) defined "role" as "a position occupied by an individual in the context of a social relationship" (p. 785), which draws attention to social relationships. Similarly Biddle and Thomas (1966) noted that interactions and expectations of the role holder and the related relationships shape the role. Clemow *et al.* (2018) defined work functions as "core role delivery" (p. 71), and tasks as "core work behavior and activity that are needed to succeed at the work function" (p. 71) setting a hierarchical order between the three, role – work functions – tasks. This hierarchical thinking is adopted as a base for this study with the exception that "task" is replaced by "responsibility".

Responsibilities and roles in construction management

Individual roles and responsibilities have been addressed in many studies from the employee's point of view, and studies concerning the legal responsibilities of the project parties have addressed the construction management responsibilities wider as discussed below. Views covering the employers' views on the responsibilities are rare, similarly as are studies covering the full range of construction management responsibilities from the role/task point of view.

Specific roles and responsibilities in construction management have been addressed in studies by Aulin and Capone (2010), on health and safety coordinators, Gluch (2009) on the characteristics of environmental professional roles, and Sommerville *et al.* (2010) on construction project managers. Aulin and Capone (2010) argued that a clear definition of accountability and responsibility for health and safety in a project can control accident-related losses on construction sites. The term responsibility in their research refers to the legal form of responsibility and the term role in their study means the different work functions the person has. Their study was a document analysis on EU, Swedish and Italian legislation for health and safety looking at the client's point of view, when appointing a health and safety coordinator for a project. Gluch (2009) used a range of research methods such as observations, document analysis and employee interviews to study environmental professionals' roles. The

study does not discuss responsibilities, but instead discusses how the environmental professional's role and identity are formed in the workplace. Gluch (2009) explained that "professional roles and identities do not exist 'out there'; they are social constructs shaped through ongoing social processes of interactions between individuals, artefacts or organizations and the institutional context in which they are embedded" (p. 962), which goes together with Merton's (1949 cited Swan *et al.* 2016) definition of role. Sommerville *et al.* (2010) used a survey approach asking construction project managers to identify which roles they undertook in a project. They used the terms role and functions interchangeably. Their list included 32 roles/functions such as achiever, communications facilitator, inspector, monitor, organizer, planner and quality coordinator.

Gustavsson (2015) studied emerging management roles in collaborative construction projects. They used the term role to describe the position e.g. project manager or a foreman, and the term function for items such as "coordinating project work" or "facilitating communication" (p. 151). They argued that although the functions have been widely standardized by different professional bodies, they vary in practice. Mäki and Kerosuo (2015) defined the specific tasks of site managers, however, this was not done to discuss the tasks themselves further, but to see how the site managers use Building Information Modeling (BIM) in their daily tasks. They shadowed two site managers using audio and video recording, photographs and field notes, and after the shadowing they interviewed the site managers. The daily tasks were preparing calls for bids and procurement, work planning and briefing, solving problems for others, paperwork, looking for initial data for the bids, and scheduled meetings.

Research by Hughes and Murdoch (2001), Arditi and Ongkasuwan (2009), and Arditi and Alavipour (2019) covers construction management responsibilities wider, however, the focus in these ones is the legal form of responsibility, whereas this research is focusing on the role/task form of responsibility as defined by Jacob (2015). The work conducted by Hughes and Murdoch (2001) focused on clarifying the responsibility terminology used in construction contracts and the work provides valuable insights into organizational liabilities in the UK context. The currency of the work can be debated, however, the terminology of contract roles reported in the study provides some information also from the role/task point of view. Arditi and Ongkasuwan (2009) and

Arditi and Alavipour (2019) studied the perception different parties have on a construction project in terms of the contractual responsibilities of a construction manager as the project owner's agent. They identified 124 duties and responsibilities from the literature to be used in a survey, covering eight construction management disciplines: project management, quality management, information management, risk management, safety management, value management, contract management, and schedule management.

Job advertisements

The content of the job advertisement, and the specific wording to describe the role and the responsibilities, are influenced, most often, by both the hiring manager and the recruitment professional (Browning 2011). The recruitment professional refers here to the construction company's human resources department but can be also an external consultancy. The hiring manager can be the direct line manager of the new employee or further above in the management chain. The more junior or more general the open position is, the more the writing of the job ad is the responsibility of the company's recruitment professional (Ellis and Abbott 2014). The hiring manager understands best the role and the responsibilities, as they are directly involved with the role and its responsibilities. The recruitment professional, on the other hand, should look more broadly, connecting the recruitment with the whole company's strategy, mission, current competence pool and competence gaps, as that is their expertise area.

Lima *et al.* (2017) argued that if "a company wants to be effective in the hiring process, their job advertisements should be as accurate as possible in the definition of a suitable profile, and the areas of practice" (p. 3). Mathews and Redman (1998) found the nature of the job, salary and the key responsibilities to be the three most important factors to attract applications. Rafaeli and Oliver (1998) identified four elements, which are common to most job ads: an organizational identity, human resources needs, requirements to fulfill these needs, and information on how to contact the organization. They argued that these four elements serve the formal function of advertising an open position for the employment searching public, however, other elements might be added for the general public, members of the organization itself, and other organizations to communicate the power and image of the organization. These other elements mean that job advertisements are not only a

recruitment vehicle for new employees, but also a vehicle to promote the company image (Rafaeli and Oliver 1998). It needs to be noted that the study by Rafaeli and Oliver (1998) was completed in the era when jobs were advertised mainly in newspapers, and anyone reading the newspaper could become exposed inadvertently to the job ad. The same does not necessarily apply to the era of Internet, where jobs are advertised mostly on the companies' websites, employment websites such as Indeed and Monster, and social networking sites such as LinkedIn and Facebook (Kim and Angnakoon 2016), and are therefore directed mainly to the employment searching public. However, job ads still have their role in creating or maintaining the company image as a more recent study by Liu (2020) showed. The research discovered that detailed information about the responsibilities does not only satisfy job seekers' information needs, but can also improve perceptions toward the job and the company. Walters and Fage-Butler (2014) found out that some elements of the job ads have remained constantly the same from 1961 to 2011, spanning from the newspaper to the Internet era. While some elements have been omitted, even more have been added. They introduced six "principal areas as the foundation of contemporary job ads: title, organizational identity, job description, personnel specifications, practical information and contact information" (p. 47–48). Walters and Fage-Butler (2014) argued, similarly to Rafaeli and Oliver (1998), that job ads are a purpose-driven genre.

Job advertisements are not necessarily an exact reflection of the work responsibilities and requirements in practice (Kim and Angnakoon 2016). Job ads are likely to reflect the reality as it is perceived by the writers (Harper 2012), which might be different from the reality as it is experienced by professionals in practice. In addition, when analyzing job ads, one needs to consider all the drivers behind them (Brooks *et al.* 2018), not just finding the most suitable candidate, but also what the company wants to communicate, and to whom with the job ad. It is important to also remember that a job ad is not the same as the actual position description, which has been agreed on with the selected candidate, although the two share many elements as can be seen from Armstrong's (2006) human resource management handbook. He lists "role title, department, responsible to, purpose of the role, key result areas, need to be able to do, and expected behaviour" (p. 191) as parts of "a role profile". Job ads are one of the first steps to finding an ideal candidate for a role. A lot can happen between writing and

publishing the job advertisement and signing a contract with the selected candidate. The pool of candidates and the pool of existing competences within the company have their impact on what the actual position description will be.

Job advertisements have been a popular form of data in the information technology discipline, and in library and information sciences, however, examples from the construction discipline are rare. Although job ads have been most commonly used through content analysis to study competence requirements of roles, several studies have also looked at role responsibilities (Kim and Angnakoon 2016), and genre analysis has been applied to job advertisements to study organizational communication (Garzone 2019). Examples of genre analysis are the studies by Rafaeli and Oliver (1998), and Walters and Fage-Butler (2014) which were discussed earlier. In the information technology discipline, Hussain *et al.* (2017) used a combination of job ad and interview data to identify competences required in software development and IT operations (DevOps) role. From the job ads, they also looked at the tasks and responsibilities related to Global software engineering by using directed content analysis and summative content analysis approaches. In library and information sciences, Meier (2010) analyzed science and technology librarians' responsibilities, investigating whether the librarians were overtasked. Their research was a quantitative content analysis measuring how many separate responsibilities were listed in each job ad. Xia and Wang (2014) evaluated the competences and responsibilities required of social science data librarians by using text analysis and tag clouding to measure term occurrence and co-occurrence. Miller and Horan (2017) looked at how information preservation roles, responsibilities, and education, experience, skills and knowledge requirements have evolved from 2004 to 2015. They analyzed 106 job ads by capturing quantitative data about the items included in the job advertisements and by coding individual elements of the content on a spreadsheet. Twenty-five types of responsibilities were identified in four main categories of planning and administration, care and treatment of physical collections, digitization, and digital preservation. Job ads as data have been used rarely in the construction discipline, and there is a limited number of studies, which would have used them to study the roles or the responsibilities. Most often the focus has been on studying competences as in the study by Barison and Santos (2011), where they used content analysis to generate competence requirements from the responsibilities and functions, in addition to

directly identifying competence requirements from 22 BIM Manager job advertisements.

Methodology

Research method

The aim of this research was to enhance the understanding of construction management responsibilities by looking at how job advertisements frame the responsibilities of construction management professionals. Although the sample included individual job ads, it was not the intention to look at each specific role, but rather to look at the construction management responsibilities across the roles.

The scope of this research was the main contractors in building construction, as the employer of construction management professionals. The research question was "How do job advertisements frame the responsibilities of construction management professionals?"

A qualitative documentary research approach (Tight 2019) was applied. Selected job advertisements were analyzed using genre analysis and qualitative content analysis. Genre analysis was used to investigate how the responsibilities were presented through the structure of the job advertisements, and qualitative content analysis was used to define the construction management responsibility areas. Bowen (2009) discussed documentary research as a qualitative research approach listing various benefits such as efficiencies, cost-effectiveness, and objectivity. Job ads are easily available and the analysis is cost-effective as it can be done as a desk study without travel or other associated costs. These efficiencies are important especially when looking at data across a wide range of construction management roles from multiple companies in different countries. When the researcher is not collecting the data, rather selecting, the researcher's presence is not inadvertently influencing the collected data as is the case with methods such as surveys, interviews and focus groups. With the advantages come disadvantages, such as biased selectivity, when choosing the collection of documents (Bowen 2009). To manage any disadvantages, inclusionary and exclusionary criteria (Gross 2018) were considered carefully. This is discussed further under Selection criteria.

Genre analysis was used to investigate how the responsibilities were presented through the structure of the job advertisements. Genre analysis' origin is in the field of English for Specific Purposes and discourse analysis (Bhatia 1997). Hopkins and Dudley-Evans (1988 cited Lakic 1997) stated that the starting

assumption of genre analysis is “an explicit description of the way in which texts are organised” (p. 2).

To define the construction management responsibilities, the job advertisements were analyzed using qualitative content analysis. Elo and Kyngäs (2008) argued that the aim of qualitative content analysis is to provide “a condensed and broad description of the phenomenon” (p. 108).

The conducted analyses processes are further explained under Data analysis.

Selection criteria

The sample, a selection of job advertisements, was selected between November 2018 and February 2019 from the United Kingdom (UK) and from the United States of America (USA). The companies selected, five from each country, were among the biggest building construction main contracting companies in the two countries. Data was collected directly from the construction companies’ career websites as this was how the large construction companies advertised their positions in the UK and the USA. Large companies were thought to have a larger number of different types of positions open than smaller companies. The latter is supported by Cameron *et al.* (2013) who found out that smaller companies use external consultants more often than big companies carrying out specific responsibilities such as safety management-related responsibilities. These factors, the two different markets and the selection of large companies, enabled capturing a large number of different types of roles.

The adopted construction management definition by Puolitaival *et al.* (2019) was used to inform the selection of the job advertisements. As per the definition, the job ads selected were required to include the aspects of managing cost, time, quality, health, safety, security and/or environment. Purely administrative, strategic, and other job ads that did not require any specific construction industry experience or education were excluded.

Some companies advertised multiple similar positions at the same time. To reduce unnecessary duplication, exclusion criteria was adopted. When the content in two or more job advertisements was the same, but the role name was different, for example “carpentry foreman” and “concrete foreman”, only one of these was included in the final sample and named “foreman”. When two job ads were otherwise the same, but the location of the position was different, only one of the job ads was included. When there were minor differences between two job ads, with no practical impact on the analysis, the job ads were considered the same,

and only one of them was included. Although similarities existed also between the companies, the differences were greater, and these were not considered to be duplications. The differences were even greater between the different companies in the UK and in the USA due to the different terminology used in the two countries. Comparing the terminology was included in the analysis, not in the selection stage. The original sample included 472 job advertisements and after the removal of the duplications, as described above, the final sample was 231 job advertisements, including 119 from the UK and 112 from the USA.

Data analysis

Lakic (1997) stated that genre analysis can inform about the process of communication in a genre. Swales introduced the concept of “moves” into genre analysis, where each “move” in the text supports and clarifies the communicative purpose of the genre (Lakic 1997). The job advertisements were analyzed to identify these “moves”. The aim was to define the moves so that they were applicable across the job advertisement sample and that they did not overlap. Moves, which explicitly described responsibilities, were looked at more in detail. All job ads were saved without their formatting or images on spreadsheets, one file for each country and a separate sheet for each company. A variety of differently structured job ads were also saved as separate files including the full formatting and images. These files were used to identify the moves in the job ads, which were then also recorded on a separate spreadsheet for analysis.

The qualitative content analysis followed Schreier’s (2012, p. 6) eight steps for qualitative content analysis:

1. Deciding on your research question
2. Selecting your material
3. Building a coding frame
4. Dividing your material into units of coding
5. Trying out your coding frame
6. Evaluating and modifying your coding frame
7. Main analysis
8. Interpreting and presenting your findings.

After formulating the research question, the material (data) was selected. This data was the part of the job advertisements, which described the responsibilities excluding the competence and other sections as the focus was on explicitly expressed responsibilities. The definition of construction management, as defined by Puolitaival *et al.* (2019) was used to develop an unconstrained coding frame (Kyngäs and Vanhanen 1999),

Table 1. Example of the coding process.

	Job advertisement text	Responsibility reference	Coding category
Role name	Superintendent		
Overview of the work functions	Overall view on the work area The Superintendent is responsible for field operations on the project(s) assigned in order to achieve timely and profitable completion of each project. The Superintendent directly supervises field labor force, including laborers/craft workers. This position must demonstrate strong leadership, organizational and time management skills, as well as have strong communication and client service skills.	achieve timely completion of each project achieve profitable completion of each project directly supervises field labor force, including laborers/craft workers	Time (general) Cost (general) Coordinate-Human resources
Description of the responsibilities	What You'll Do: Direct day-to-day on-site supervision of field labor force; Inspection of Contractor or (Sub)Contract operations to ensure compliance with Contract; Maintain good relationships with internal and external clients, including representatives of Owner and Architect/Engineer; Develop and maintain site logistics plan, in coordination with Project Manager; Conduct quality inspections; Coordinate site testing and inspection efforts. Monitor costs, including labor time and material; Communicate and enforce company's safety and health management program; Demonstrate commitment to an Injury-Free Environment through own actions and mentoring others; Manage schedules, including preparation of detailed short-term schedules and ensuring all activities take place on or ahead of scheduled dates; Prepare and submit Superintendent's Daily Reports; Attend and participate in project meetings, including subcontractor meetings.	Direct day-to-day on-site supervision of field labor force; Inspection of Contractor or (Sub)Contract operations to ensure compliance with Contract Maintain good relationships with internal and external clients, including representatives of Owner and Architect/Engineer Develop site logistics plan, in coordination with Project Manager Conduct quality inspections Coordinate site testing and inspection efforts Monitor labor time Monitor costs Monitor material Communicate and enforce company's safety and health management program Demonstrate commitment to an Injury-Free Environment through own actions Demonstrate commitment to an Injury-Free Environment through mentoring others Manage schedules, including preparation of detailed short-term schedules Manage schedules, ensuring all activities take place on or ahead of scheduled dates Prepare and submit Superintendent's Daily Reports Attend and participate in project meetings, including subcontractor meetings	Coordinate-Human resources Coordinate-Contracts Communication (general) Organize-Human resources; Products and material; Plant, equipment and tools Coordinate-Human resources; Products and material; Plant, equipment and tools Monitoring-Quality Monitoring-Quality Monitoring-Time Monitoring-Cost Coordinate-Products and material Communication-Health and safety Communication-Health and safety Training-Human resources Forecasting and planning-Time Control-Time Communication (general) Communication (general)

which provided an initial coding structure, but also allowed new categories to emerge (Elo and Kyngäs 2008). The coding itself was executed in QSR NVivo. In practice, an initial sample of the job ads was coded using the frame and as it was noticed that some of the data did not fit the frame, the frame was restructured including the addition of some new categories, to accommodate the data. In this research, the vertical axis of the frame was named "responsibility actions" and the horizontal axis "responsibility objects". Responsibility actions are verb-like nouns such as "Forecasting and planning" and "Control", which describe the action taken. Responsibility objects on the other hand are objects of these actions such as "Time" and "Quality".

Text segments such as "conduct quality inspections" (Superintendent, Company 5, USA) in the job advertisements, which were identified to include a reference to a construction management responsibility are called "responsibility references" (hereafter also simply "references"). The final coding frame can be seen in Table 4, p. 21. The sample included nearly 5000 responsibility references. An example of the coding process is presented in Table 1 using a Superintendent job advertisement from Company 5 in the USA.

Determining under which category each identified responsibility reference belonged was not always straightforward, as for some, multiple options existed, and some responsibility references were too vague to

be placed exactly under a responsibility action or a responsibility object. Although mutual exclusiveness is less important with qualitative analysis compared to quantitative analysis where frequencies are looked at (Stemler 2000, Fisher and Marshall 2009), robust coding rules were seen as important to maintain consistency throughout the analysis. An example of the multiple options was “develop site logistics plan” (Table 1). Site logistics plans in their essence were seen to be about organizing and coordinating project resources. Therefore, the reference sat clearly under the Organization responsibility action, however, it covered all three resource categories including movement and placement of human resources, products and material, and plant, equipment and tools, belonging under all three responsibility objects. This was allowed, as from a qualitative point of view, this had no impact on the results. An example of a too vague reference was “prepare and submit Superintendent’s Daily Reports” (Table 1). Reporting is about communicating information. Therefore, it was decided that all references related to reporting were coded under Communication. However, in this specific case, there was no indication of what exactly e.g. time, cost, is being reported and the reference was placed under Communication responsibility action, but not under any responsibility object, where it informs that preparing and submitting reports is a communication-related construction management responsibility, although it cannot be specified what exactly is the object of communication i.e. what is being communicated. An example of the non-specific responsibility action was “achieve timely completion of each project” (Table 1). No specific action to achieve timely completion was stated i.e. these could be any of the time-related responsibility actions. Therefore, the reference was coded under the responsibility object Time, but not under any responsibility action, where it informs that achieving timely completion of each project is part of the time-related construction management responsibilities, although it has not been specified what actions are needed to achieve it.

The main analysis process itself is integral in describing the findings and therefore steps 6–8 are discussed under Findings.

Findings

Job advertisements as a frame for the responsibilities

Five different “moves” were identified from the job advertisements through the genre analysis: description of the role and the responsibilities, candidate requirements, work environment description, application

process information, and organizational identity. The wording style, the order of the moves, use of titles for the moves, and the overall visual appearance of the job ads were very company-specific although there were some exceptions, where the structure and wording style of the job ads varied even inside a company. Although all the five moves were very common with all investigated companies, only three of the moves, the description of the role and the responsibilities, candidate requirements, and information regarding the application process were present in all job ads. These were usually presented in this same order moving from the description of the role and the responsibilities to the candidate requirements and then to the application process information. Where organizational identity or work environment description were placed in the job ads varied. These were not necessarily presented under one section each, instead, in many cases, some parts of these were presented right under the role name and then the rest before the application process information. The “moves” can be further divided into sub-moves, however, when going to more detail, the more dissimilar the different companies’ job advertisements start to look. Candidate requirements included, as sub-moves, not only the required competences and formal qualifications but also in some cases permits such as a work permit or a driver’s license. Work environment description included specific details about the work environment such as information about the project, the team, or the physical environment. Application process information included submission details such as submission format, closing date, and where to submit. Information about the company image unlike other moves was in several cases presented with photos, but also as text describing company values, mission or vision, commitment to diversity and inclusion, or providing favorable statistics about the company. Description of the role and responsibilities was the move, which included all the explicit information about the responsibilities and therefore this became the focus of the investigation.

The analysis revealed six sub-moves or sections for the description of the role and the responsibilities: role name, role ID, role location, contract type, an overview of the work functions, and description of the responsibilities. The role ID, location and contract type are irrelevant for this study. The role name, overview of the work functions, and description of the responsibilities can be seen as a breakdown structure each subsequent level of the breakdown structure describing the responsibilities more in detail than the one before. The first level, the role name, is simultaneously the title of the job

Table 2. The most common titles of levels two and three by each company.

		Second level	Third level
Company 1	UK	Description of the work area	Job responsibilities
Company 2	UK	Job purpose	Responsibilities
Company 3	UK	Role overview	Key responsibilities
Company 4	UK	Opportunity	Responsibilities
Company 5	UK	The opportunity	Your responsibilities will include
Company 1	USA	Job description	
Company 2	USA	Position description	Essential duties and responsibilities
Company 3	USA		Job summary
Company 4	USA	Position overview	Responsibilities
Company 5	USA	Overall view on the work area	What you'll do

advertisement, and it was present in all job advertisements. The second level, the overview of the work functions, was present in most job ads, however, how the section was written, if the section had a title, and what the title was varied between the companies. The third level, the description of the responsibilities, was present in most job ads. Similarly, with the second level, it did not always have a title, and the titles varied. These three levels and their characteristics are discussed more in the following paragraphs. Table 2 provides an example of the titles of levels two and three.

The first level, the role name, is also the title of the job advertisement. With online job ads, this title is the first and the only thing a job seeker sees at first when searching for jobs online. The right title, the role name, is what attracts the job seeker to open the job ad, as the role name has a certain meaning in the professional context. Site Manager A and Site Manager B might have somewhat different roles and responsibilities depending on the local, company, and project context, however, for a construction management professional, the role name provides an indication of what the role is about and what responsibilities are included. There were four job advertisements in the sample, which had only the first level, the role name, and no further information about the role or the responsibilities, but the job ad continued straight with the candidate requirements.

When looking at the second level, the overview of the work functions, the style of the job ads varied greatly. One of the companies did not have this level in their job ads at all and another company did not have a title for the level. The most common titles from each company are presented in Table 2. In some cases, this level collated the description of the responsibilities, and in some, it was just an outline. In most cases, it was a single paragraph or just a single sentence. How good overview it provided varied greatly, some overviews repeating almost all the descriptions of the responsibilities and some being somewhat vague as in the case of a Preconstruction Manager (Company 2, UK), "The Preconstruction Manager has overall responsibility for

the preconstruction process from project inception through start of construction", and Construction Safety Manager (Company 4, USA), "Under minimal direction supervises personnel engaged in the ES&H functions within the company or on the same project".

The third level, the description of the responsibilities, was present in most job advertisements and it was presented in all of them with bullet points, however, there were 16 job ads that had a very detailed overview of the responsibilities, but no separate bullet point list for the responsibilities. In these cases, the overview served both purposes, providing an overview of the responsibilities and the description of the responsibilities. The titles of the level three overlapped somewhat with the second level titles between the companies and one company had the second and third level under the same title. The length of the responsibilities list varied from just a couple of bullet points to 27, which could be interpreted either as micromanagement or as a too heavy workload. No clear pattern was seen, company, country or role wise. The most common titles are presented in Table 1.

Construction management responsibilities

The first level, the role name, provided an indication of the responsibilities. There were 109 role names, with 106 different ones in the sample (Table 3). This included not just different role types, but also different role levels such as junior estimator, estimator and senior estimator. The UK job advertisement sample included 41 different role names and the USA – 68. Due to the differences in terminology used in these two countries, only three role names overlapped: Estimator, Senior project manager and Preconstruction manager. In Table 3 these role names are organized alphabetically under the responsibility objects, Time, Cost, Quality, Health and safety, and Environment. Some roles were focused specifically on one responsibility object in a project. Several roles such as foreman, site manager, project manager, EHS manager and project coordinator were focused on two or more responsibility objects. These are listed in Table 3 under "Multiple". Virtual Design and Construction (VDC)

Table 3. Role names.

USA	UK	USA	UK
Time		Multiple	
Construction Eng. Specialist, Planner	Planner	Assistant Project Manager	Assistant PM Construction
Construction Project Scheduler	Scheduler	Assistant Superintendent	Assistant Site Manager
Project Controls Specialist, Schedule	Senior Planner	Associate Project Ctrl. Specialist	Construction Manager
Scheduling Engineer	Senior Planning Engineer	Construction Engineer	Consultant Project Manager
Scheduling Manager	Senior Planning Manager	Construction Engineering Manager	Design Manager
	Senior Pre-construction Planner	Construction Project Engineer	Foreman
	Site Planner	Construction Project Manager	Preconstruction Manager
Cost		Construction Support Specialist	Project Director
Associate Estimator	Assistant Estimator	Craft Superintendent	Project Manager
Construction Estimator	Assistant Quantity Surveyor	EHS Coordinator	Senior Design Manager
Cost Engineer	Commercial Manager	EHS Manager	Senior Project Manager
Director of Estimating	Cost Consultant	Engineer	Senior Site Engineer
Estimating Engineer	Cost Planner	Entry Level Project Engineer	Senior Site Manager
Estimating Manager	Estimator	Field Engineer	SHE Advisor
Estimator	Managing Quantity Surveyor	Foreman	Site Engineer
Junior Estimator	Project Quantity Surveyor	High Rise Project Manager	Site Manager
Lead Estimator	Quantity Surveyor	HSE Senior Manager, Site Mngmt	Temporary Works Coordinator
Material Management Specialist	Senior Cost Consultant	HSE Supervisor, Site Management	
Procurement Specialist	Senior Estimator	New Graduate Field Engineer	
Project Controls Coordinator -Cost	Senior Quantity Surveyor	New Graduate Project Engineer	
Project Controls Specialist -Cost		Preconstruction Manager	
Senior Estimating Engineer		Project Controls Manager	
Senior Estimating Manager		Project Coordinator	
Senior Estimator		Project EHS Manager	
Senior Specialist, Material Mngmt		Project Engineer	
Quality		Project Manager	
Quality Engineer	Associate Director -Quality	Senior EHS Manager	
Quality Control Manager	Quality Assurance Manager	Senior Pre-Construction Engineer	
Quality Manager	Quality/Technical Manager	Senior Project Engineer	
Senior Quality Manager	Senior Quality Manager	Senior Project Manager	
Health and Safety		Senior Superintendent	
Project Safety Manager		Site Engineer	
Safety Coordinator		Superintendent	
Safety Manager			
Site Safety officer		Virtual Design and Construction/Building Information Modelling	
Environment		VDC Coordinator	BIM Manager
Sustainability Engineer		VDC Preconstruction Engineer	
		VDC Project Manager	
		VDC/BIM Engineer	

and/or Building Information Modelling (BIM) role names have been separated from the others due to their somewhat different nature supporting other construction management roles with Building Information Model use.

The second and the third levels together described the construction management responsibilities explicitly and in detail and therefore they were used as the data for the qualitative content analysis to investigate the responsibilities further. The analysis revealed construction management to include 31 responsibility areas, which are based on the final coding frame when the analysis was completed. These areas are presented as a matrix in Table 4. As described in the Data analysis -subchapter, the definition of construction management provided the starting point (initial coding frame) to connect the responsibility actions with the responsibility objects. This was then further informed and transformed by evaluating and modifying the coding based on the data. When the analysis was completed, 31 cells

were populated with responsibility references. Each responsibility area is a combination of a responsibility action and a responsibility object. There are seven responsibility actions, which are set as rows in the matrix. There are ten responsibility objects, which are set as columns in the matrix. Examples of the responsibility areas are "Forecasting and planning time", "Monitoring human resources", and "Communication of contracts".

The responsibility areas can be also formatted as a list – see below:

- Forecasting and planning of time, cost, quality, health and safety, and environment (5 areas)
- Communication of time, cost, quality, health and safety, environment, and contracts (6 areas)
- Monitoring of time, cost, quality, health and safety, and environment (5 areas)
- Control of time, cost, quality, health and safety, and environment (5 areas)

Table 4. The responsibility matrix identifying the responsibility areas, responsibility actions and responsibility objects.

Responsibility actions	Responsibility objects									
	Time	Cost	Quality	Health and Safety	Environmental factors	Human resources	Products and material	Plant, equipment and tools	Contracts	Processes
Forecasting and planning	Forecasting and planning of time	Forecasting and planning of cost	Forecasting and planning of quality	Forecasting and planning of health and safety	Forecasting and planning of environmental factors					
Communication	Communication of time	Communication of cost	Communication of quality	Communication of health and safety	Communication of environmental factors				Communication of contracts	
Monitoring	Monitoring of time	Monitoring of cost	Monitoring of quality	Monitoring of health and safety	Monitoring of environmental factors					
Control	Control of time	Control of cost	Control of quality	Control of health and safety	Control of environmental factors					
Organization						Organization of human resources	Organization of products and material	Organization of plant, equipment and tools	Organization of contracts	
Coordination						Coordination of human resources	Coordination of products and material	Coordination of plant, equipment and tools	Coordination of contracts	
Development						Development of human resources				Development of processes

- Organization of human resources; products and material; plant, equipment and tools; and contracts (4 areas)
- Coordination of human resources; products and material; plant, equipment and tools; and contracts (4 areas)
- Development of human resources and processes (2 areas).

To reduce the detail in the description the responsibility areas can be also listed using only the responsibility objects: time management, cost management, quality management, health and safety management, environmental management, human resource management, product and material management, plant, equipment and tools management, contract management, and process management.

Definition of construction management

When analyzing the data, it was noticed that some of the identified responsibility references did not obviously belong under the initial coding frame. It was also initially thought that the same responsibility objects would apply to all responsibility actions, but this was not the case. More precisely, the responsibility objects, Time, Cost, Quality, Health and safety, Environment and Security, were not the best suited to Organization and Coordination responsibility actions. Rather, Organization and Coordination were about Human resources; Contracts; Products and material; and Plant, equipment and tools. Some new categories emerged from the data such as Development of human resources and Development of processes. On the other hand, all categories including Security responsibility object remained empty indicating that security was not a construction management responsibility within this sample. This coding frame evaluation and modification stage resulted in a revised definition of construction management: "Construction management is about forecasting and planning, communication, monitoring and control of time, cost, health and safety, quality, and environmental factors; organization and coordination of human resources, contracts, products and material, plant, equipment and tools including digital tools; and development of human resources and processes". Digital tools were included in the definition to include the modern way of performing construction management responsibilities, by using digital tools, which was evident explicitly through the Virtual Design and Construction and Building Information Modeling roles and responsibilities.

Discussion

Role and responsibilities can be seen to be presented in the job advertisements as a breakdown structure including three levels: role name, overview of the work functions and description of the responsibilities. The middle level could be named also “role overview” or “responsibilities overview”, without changing the meaning or content of the levels, to emphasize the term role or the term responsibilities more, if needed. Similarly, three levels can be seen also in the literature, role – work functions – tasks (Clemow *et al.* 2018). These specific names were not used for the levels though in this study, as we wanted to highlight the first level being a name, and the second level did not cover the work functions systematically, and therefore it was more appropriate to call it an overview, and the job ads clearly use the term responsibilities for the third level, not tasks. The discipline-specific literature uses the terms in places interchangeably e.g. Sommerville *et al.* (2010) used the roles and functions as synonyms. Gluch (2009) on the other hand used the term role to describe work functions. How the term role name is used in this study is similar to Gustavsson (2015) use of the term role. They had roles such as project manager and foreman.

When looking at the sample as a whole, there is a clear step between the first and the second level. However, the levels two and three form a spectrum of how in detail the responsibilities are described. The detail of both the second and the third level varied. In some cases, the second level in one job ad was as detailed as the third level in another job ad, and in some cases, the second level was very vague as the two examples presented on page 19 show. In some of the job ads, the second and third levels were included as one item. Although there is the step between the levels one and two, in an online environment, it is important, however, that the levels go well together i.e. the role name matches the work functions and the responsibilities as well as possible, to draw the attention of the suitable candidate to open the job ad. Before the online era “Job title” was rated as the second least important item in the ad (Mathews and Redman 1998). Lima *et al.* (2017) pointed out that for job ads to be effective, they should be as accurate as possible in the definition of the work profile. This goes beyond the role name, including all three levels.

Job advertisement’s main purpose on organization’s own website is to attract suitable candidates to apply for the position. Rafaeli and Oliver (1998) stated that “an ad that does not include this set of text violates baseline

norms of the medium of ads” (p. 345) i.e. for the job ads to fulfill their purpose, they need to include certain elements (moves). With “this set” they referred to their “skeleton of a job ad” including the organization’s identity, human resources (HR) needs, requirements to fulfill the HR needs and information about forming contact with the organization. The sample investigated presented the genre well including the “skeleton of a job ad”, excluding only four job ads (out of 231), which did not contain any HR needs. There is no reason to force the job ads otherwise into one format e.g. how the information is organized, what additional elements it contains or what the visual appearance of the ad is, as long as the job ad contains “the skeleton”.

The 31 defined responsibility areas provide a compact presentation of what the construction management responsibilities are, and a detailed description of what construction management is. Findings from studies on individual professionals’ roles and responsibilities could be placed under the categories to provide detail in each responsibility area. As an example, Gluch’s (2009) findings could be placed under the health and safety responsibility object. There are many similarities between the identified responsibility actions and objects, and Sommerville *et al.*’s (2010) functions of project managers: Forecasting and planning vs. Planner, Communication vs. Communications facilitator, Human resources vs. Human resource manager, Health and safety vs. Safety coordinator, Monitoring vs. Monitor/evaluator, Quality vs. Quality coordinator, Control time vs. Progress controller, Organize human resources vs. Resource allocator. Arditi and Ongkasuwan (2009) 124 construction management responsibilities could be placed under the created responsibility areas, when they had arranged the responsibilities under the project life cycle phases. Five out of the ten responsibility objects of this study go together with five out of their eight “construction management disciplines”: Time vs. Schedule management, Health and safety vs. Safety management, Cost vs. Value management, Contract vs. Contract management, Quality vs. Quality management. Hughes and Murdoch’s (2001) 27 “actions” differ considerably from the responsibility actions of this study, mainly as they are more detailed. There are only two direct matches: monitor and coordinate.

Limitations

There are some limitations that need to be taken into consideration when looking at the results:

1. The job advertisements present their writers’ view on the responsibilities and the responsibilities

might be presented in a manner, which is flattering to the company.

2. The sample of job advertisements captures a limited number of job ads at a certain point in time and place, and is not therefore a longitudinal, complete representation of the role names or the responsibilities in construction management globally.

The first limitation is addressed on page 12 under Methodology/Research method concluding that the method was the best suited among the feasible methods for this research. Considering that this research is looking at the responsibilities across the roles in a summative manner, it is believed that the limitations that job ads have when describing the responsibilities in a realistic manner, have very little, if any, impact on the results.

This research investigated job ads collated from 10 large building construction main contracting companies in the UK and the USA (second limitation). It can be argued that if other countries or other companies had been looked at, there might have been differences in the results. Role names would be somewhat different, and responsibilities might be organized differently under the roles in another local or company context. However, considering that this research is not presenting the responsibilities under individual roles, but rather presents the construction management responsibilities across all the roles, the impact on the results is believed to be minor. However, it is likely that “security” would be defined as a construction management responsibility in another local or company context as it is defined as one in the literature (Hughes and Murdoch 2001, Arditi and Ongkasuwan 2009).

It is important to update the definition of construction management and the responsibility areas regularly. As an example, digital tools were added to the revised definition to include the modern way of performing construction management responsibilities.

Conclusions

This research offers a novel perspective on construction management responsibilities by looking at how job advertisements frame the responsibilities of construction management professionals. This approach offers a view on a wide range of construction management roles and responsibilities, and through this enhances the understanding of construction management responsibilities. The redeveloped definition of construction management provides a relatively detailed but quick understanding of the responsibility

areas. The responsibility matrix, which includes the same elements as the definition, provides a typology of the responsibilities. The job ads offer an insight, with some limitations as discussed earlier, into employers’ views on their employees’ responsibilities. This view is rarely discussed in the literature.

This research was looking at the role and responsibilities description part of the job ads in detail and therefore the recommendations regarding the job ads focus on this area only. In an online environment, it is firstly important that the role name matches the role and the responsibilities as well as possible to draw the attention of the suitable candidate to open the job advertisement. Secondly, the information provided at the levels two and three needs to be accurate as well, to attract suitable candidates to apply. The second and the third level need to have a balance. If the overview of the work functions is vague, then the description of the responsibilities needs to be more detailed to satisfy the job seekers’ information needs. However, a very detailed and long list of responsibilities could be interpreted as an indication of micromanagement or as a too heavy load of responsibilities, and therefore it can work against the employer, deterring the candidates from applying.

Further studies

The developed typology provides a framework for exploring each responsibility area, such as forecasting and planning of time, or monitoring of quality, further. A survey approach or employer interviews could reveal how accurately job advertisements actually describe the employers’ views. Investigation on the recruitment process in construction management wider could inform more on the role that job advertisements play in the process. This could include comparisons of job advertisements and actual job descriptions for positions. Connections between the different sections of the job advertisements could be looked at including the connection between the described responsibilities and required competences.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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