Wayfinding: A Grounded Theory Study
of the Information-Seeking Behavior of Constructors

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Abstract

This study examined how and why practitioners in the construction industry sought information in their routine work activities. A grounded theory method found the main concern of constructors is the ability to seek accurate information efficiently and effectively. A substantive theory termed *wayfinding* was developed through interviews with 24 constructors, which is applied using five strategies. These strategies include clarifying, confirming, sourcing, preparing, and managing risk. Strategies are adopted based on the intent and type of information being sought within perceived boundaries of time and accuracy required. Techniques used to implement these strategies include networking, branching/filtering, and cost-saving. The implementation of the strategies varied with experience, with novices using a more limited range of strategies and techniques than experienced constructors.

Keywords: Wayfinding, Information-seeking, constructors, strategies, managing risk.

Introduction

Those people involved in the management of construction work in a fast-paced, high-pressure environment where decisions must be made quickly and effectively. The ability to find accurate information rapidly is an important part of this environment (Sears, Sears, & Clough, 2008; Stowe, 2009). Although it is an essential process for the constructor, it is barely mentioned in most texts developed for construction curricula in higher education; the result is that it is not a standard subject of study and hence is learned through personal experience in the "school of hard knocks" once the field is entered.

In this study, the author examines the professional lives of constructors using a classic grounded theory method and finds that seeking information is their main concern. The result of the study is a theory that explains how and why constructors seek information as part of their day-to-day activities. This theory, called wayfinding, explains the information-seeking behavior of constructors so that it may be used by people currently in industry, educators preparing people to enter the field, and other related, interested parties.

Method

The author of this study examines the way that practitioners in the construction industry seek information in the course of their work. The selection of a grounded theory approach was driven by the intent of the investigation. The objective was to provide an integrated explanation of how this information-seeking behavior takes place in the working lives of constructors to inform practice and praxis. Grounded theory is particularly well-suited for fields of practice, as it can be used to "give the practitioner a conceptual tool with which to guide practice" (Merriam & Simpson, 2000, p. 113). The developed theory may therefore be usefully employed by those in practice, teachers in the field, and other related disciplines. A classic grounded theory approach was used, as described by Glaser (1964, 1968, 1972, 1978, 1992, 1998), Glaser and Kaplan (1996), and Glaser and Strauss (1965, 1967).

Individual interviews were the primary data collection tool; 23 interviews were conducted with a total of 24 participants. Interviews started after the research protocol was approved by the Institutional Review Board; analysis commenced with the first interview and continued throughout collection. Categories emerged as data were initially open-coded directly on the transcripts and field notes. The memoing process helped the researcher to discover the main concern and core category quickly; selective coding and theoretical sampling were then emphasized until saturation of concepts was reached.

After temporal spacing, the researcher returned to the data and memoranda for theoretical coding to integrate the categories into a cohesive theory, finding all approaches to be members of the strategy family (Glaser, 1978; Hernandez, 2009). The main concern of information-seeking is resolved by practitioners through adopting various wayfinding strategies, which were conceptualized in the theory as it was written. Specific techniques used within these strategies that maneuver through others while wayfinding are also identified, and the differences between strategies and techniques used by novices and experienced practitioners delimited.

Quotations and Definitions

For clarity, all quotations taken during the interviews conducted for this study are shown in italics without any quotation marks. They are all anonymous, and gender is not noted except for instances where an appropriate pronoun makes the reference more readable. All other quotations are cited in standard format. The following terminology was used throughout the study:

Constructor – a person who is employed within the construction industry primarily as one who is involved in the management of the building process, as opposed to the design or facility management processes or actual trades. Actual titles might range from project manager to estimator to scheduler and others. Although many constructors have college degrees, this was not a prerequisite for this study. A constructor is also referred to as *practitioner*.

Information-seeking behavior – actions by constructors to find information, ranging from design clarifications to constructability issues, chiefly used as part of the decision-making process. Information-seeking behavior is also referred to as research or research behavior.

Description of the Main Concern

The main concern of constructors is the ability to seek information quickly and accurately. Seeking information is a significant part of constructors' days. *I'd say 60-75% of my time is spent finding things out—it's a constant battle.* Information-seeking is embedded into the modern construction process. The construction plans show the completed product, the *what*, but not how to achieve it, the *how*. Seeking information on these *how*, *what*, *where*, *when*, and *who* issues is an everyday part of constructors' lives.

Whetten and Cameron (1995) identified informational deficiency as a primary source of conflict in business organizations. While conflict may be undesirable in any organization, a lack of information is particularly critical in construction due to its nature. The construction process, once commenced, is extremely schedule- and cost-driven. Any lack of information that could potentially hinder progress must be dealt with immediately.

Equipment and labor costs can easily run in the thousands of dollars per hour on large and complex jobs without even considering the additional costs of other workers, subcontractors, and resources that might be waiting or affected by any delays. Constructors must therefore become efficient in terms of costs and time while simultaneously seeking and obtaining accurate information.

Information is viewed through a positivist paradigm by constructors. As Guba and Lincoln (2005) described this paradigm, inquiry is used for explanation, prediction, and control. The high-pressure, high-stakes construction environment demands information to solve problems; there is no inquiry for its own sake or for personal transformation. Information is needed, it exists, and the matter is simply to find it—even if that task is not so simple.

> I always felt that even in our industry there's always an answer out there someplace and if you have enough tenacious attitude about yourself, you will eventually find the answer. There's somebody out there who's got the answer. . . It's always there. I don't know if I've never not found the answer to a question. At least in our world.

Building is an action verb and the resultant product of construction actions. Constructors practice in rapidly-changing environments that are filled with risk. Civitello (1987) stated that costs, complexity, and time pressure in the construction have all increased rapidly and described it as "one of the most intensely competitive work environments ever to evolve" (p. 4). Gould and Joyce (2009) stated that "Leading a significant construction project can be compared to going into battle" (p. 48). Just like in battle, there are seemingly victors and the vanquished, with bankrupt construction companies littering the field at a higher rate

than other industries (Koksal & Arditi, 2004). As previously described, the ability to find accurate information quickly is critical in this arena (Sears, Sears, & Clough, 2008; Stowe, 2009). This ability is true universally for all levels of constructor, from novices to experienced practitioners. It is an inherent part of the construction process.

Theory of Wayfinding

Constructors resolve their main concern of information-seeking through the core variable wayfinding. The term wayfinding was selected to explain the process where constructors try to resolve their need of seeking accurate and useful information as efficiently and effectively as possible. The researcher settled on this term for several reasons. First, it accurately and literally describes the process of finding one's way to and through information to locate that which is needed. Additionally, it was taken directly from constructors' own description, albeit with a change to a gerund phrase. "You just always have to find a way to get it [information]—you just keep looking until you've got it." Finally, the term draws from other fields that have established bodies of knowledge on finding one's way in different, yet related, environments. It fits conceptually and ties in related, relevant literature from other fields.

The term wayfinding was first used by Lynch, a city planner and professor at the Massachusetts Institute of Technology, in his 1960 book, The Image of the City; he wrote of how city-dwellers made sense of their environment through mental maps and how they used them to navigate. This is similar the description of the necessity of information-seeking behavior and the paucity of research on it.

Constructors wayfind to locate information quickly and effectively to resolve their main concern of needing accurate and relevant knowledge in a timely manner; Wayfinding is done for a variety of reasons and is practiced by adopting one of five strategies based on the type of information being sought and the intent behind its use. The strategies utilized as well as the techniques used in their implementation vary with the experience of the constructor. Experienced constructors utilize a wider variety of strategies and different techniques than do novices.

Strategies of Wayfinding

The pressures and context of the construction industry have been previously examined. Constructors use wayfinding to seek information utilizing five strategies: clarifying, confirming, sourcing, preparing, and managing risk.

<u>Clarifying</u>

Clarifying is a common strategy typically used to seek information in response to a *what* or *where* question. In practice, every construction project will require clarifications, from providing missing dimensions to explaining unclear details to resolving discrepancies between the architectural and electrical drawings. Constructors usually have an idea of what the design intent was, but want confirmation before setting their plans in concrete (so to speak).

Clarifying has two main approaches with different intentions: resolving and shifting. As the name implies, resolving is normally a routine—relatively low-level approach of information seeking that is often delegated to less experienced and/or new constructors. Its intent is straightforward in that it simply seeks explanatory information.

Resolving can have immediate or future importance. Design information eventually but not immediately needed is generally submitted in writing to (or through) the architect with a request for providing it in a certain amount of time, such as within two weeks. For example, if an interior paint color is not noted but the construction has only progressed to the foundation stage, there is ample time for resolution of the issue without any significant time or cost impact. However, if the information is not provided in time, or if the discrepancy is not discovered until the painters are on site and ready to work, a different type of clarifying may be utilized.

Clarifying can also be used by more experienced constructors as a high-level strategy to shift responsibility and stall for time. Shifting also seeks a resolution; however, until the clarification is provided (typically by the designer), the constructor has an excuse for not proceeding with the work. Besides buying time, this excuse might also form the basis for a claim of additional cost. Shifting is typically initiated using a positive method of communication, such as a telephone call or face-to-face, but is generally followed up in writing to document the discussion.

Also, by asking for many clarifications, a constructor may imply that the design was incomplete and/or inaccurate, which reflects poorly on the designer and shifts fault for cost and time overruns away from the contractor. This maneuvering behavior may be for a current or successor construction activity that would be affected.

<div align="center">Confirming</div>

Closely related to clarifying, confirming differs in approach and intent. It might be said that confirming is to stating as clarifying is to questioning, i.e., confirming is declarative instead of interrogative. It is used much less frequently and usually in rather specific cases where ambiguity might exist but the constructor has a preferred resolution, particularly if there are cost or time considerations. Although it is offered as a statement, it is a disguised form of a request for information, with a negative response taken as tacit approval. It is a strategy used with *what* and *how* issues.

One constructor related a very specific situation where confirming was used instead of clarifying. Instead of asking a question about it,

> [W]e said, "Oh, by the way, we're going to use brown blank covers to cover up those receptacles that we're removing." Not soliciting a question or a response, but just telling them that this is how we're going to do it. . . . We obviously didn't want to ask the question; we were more inclined to say 'This is how we're going to do this.' From the surface it seemed like a good idea and we didn't give them a lot of time to think about it.

This situation was later confirmed by the constructor in the meeting minutes as a statement rather than a clarification. Clarifying is conducted by experienced constructors rather than being delegated to novices who might not be suitably prepared for this more nuanced approach. It provides a quick and cost-effective solution to the issue if accepted without question. If unsuccessful (i.e., the proposal is not accepted), the constructor might resort to another strategy, most commonly clarifying through shifting.

Sourcing

Perhaps even more commonplace than confirming, sourcing seeks information on *who*, such as providers of goods and services. Sourcing occurs most frequently during the preconstruction phase, such as during bid preparation, and tapers off as construction progresses and the project is "bought out." Implicit in the strategy is that there are usually many sources available; relevancy drives the intent to locate those who meet certain criteria (competitive pricing, availability of labor, etc.) quickly. Sourcing, therefore, typically seeks *an* answer (or answers) instead of *the* answer. For example, a constructor may not need to know every possible source that can supply concrete block to a job site, only those that are within a practicable distance need to be included initially with the final decision typically based on lowest cost.

Like clarifying, sourcing is often performed by novice constructors, particularly those in estimating departments or during the estimating phase of a project. However, when sourcing is selected by experienced practitioners, more sophisticated techniques such as networking and branching/filtering (described in the following section) are often employed to simultaneously source and manage risk.

Sourcing is directly impacted by time available and inversely affected by funds available for the work impacted. The more time is available before the sourcing information is needed, the more time may be spent gathering as many sources as possible before selection. Conversely, in an emergency, only one source may be sought to proceed as quickly as possible. With regard to cost, a very tight budget will generally mean that multiple sources will have to be sought through competitive bidding. Alternatively, a large budget might allow the constructor to pick a favorite source without need for additional competition.

Preparing

While clarifying seeks answers to the *what* and *where*, preparing reaches for the *how*, *when*, and *where*. As previously discussed, the designers are typically absent from this aspect of construction, so this part of construction is typically done between constructors of different levels on the same project, such as the general contractor and his or her subcontractors. Preparing is done with the intent of readying for the current project as well as advancing one's knowledge for the next one.

Preparing is conducted with suppliers who furnish products and installation materials as well as coordinate the installation of self-performed work. Examples of preparing are confirming what time the truck will arrive, delivering the drywall this afternoon, or requesting subcontractor information on how long of a lead the air handler unit will require for fabrication. One constructor related the experience of working with a specialty pool subcontractor on a project while simultaneously learning how to prepare better for the next job.

> We rely heavily on who's providing the pool and the pool equipment. You rely on them and say, 'Gosh, you guys have been doing this—it's your bread and butter—all we're doing is putting the concrete around it—help me understand this.' Having gone through one of these processes, the next pool that I do I have 30 questions that I'm going to ask up front because I've learned that those were relevant questions that we've paid the price at the tail end with regards to work that had to get removed and that had to get redone, things that didn't work and those types of complications that obviously were missed at that time. While we got it done, we paid a premium to get it done.

Additionally, there are local and regional differences in construction that require special preparation.

> You do have to be careful—things work differently in different parts of the state, even. In Northern Indiana, the site contractor puts the stone down for the paver. He prepares the subgrade, but up there he would provide the stone and get it rolled in tight, pretty close. The paver is going to come in and fine-tune it, check it, and pave it. So, you have to be aware of those differences and sometimes they don't find out and sometimes they miss.

The modern construction industry is one of coordinating all these different entities. On a typical project, 75 to 85% of the project is built by subcontractors. Preparing gathers information to plan, coordinate, and schedule the construction. It starts during preconstruction and runs continuously throughout the project, seeking new and updated issues. Preparing is done by all types of constructors, with more complex preparing conducted by more experienced practitioners, as well as preparing for future projects.

<div align="center">Managing risk</div>

Construction is a risky business. Many actions in the information-seeking process are tangentially related to managing an organization's risk, such preparing a confirming memorandum after a clarifying telephone call with the architect, or recording a confirming statement in the meeting minutes. Documentation is a main emphasis of risk management in many cases.

There are also other information-seeking actions directly related to managing risk. The first is the prequalification process, which usually involves requesting the contractor, subcontractor, or supplier to furnish information about his or her organization for evaluating his or her ability to perform on a particular project. This evaluation often revolves around prequalifying subcontractors and suppliers, such as obtaining Dun and Bradstreet reports, bonding capacity, or whether they are paying their suppliers on time. Generally, the greater the risk, whether to cost or time, the more information will be sought. Managing risk information-seeking approaches are conducted by all levels of constructors, although the information is evaluated and decisions made at more senior levels.

Techniques of Wayfinding

Once a strategy is selected, a variety of approaches are available to the wayfinder to employ while seeking the needed information; these approaches are referred to as techniques. The three primary approaches include networking, branching/filtering, and cost-saving.

Networking

The preferred technique of wayfinding by constructors is networking. For the purposes of this study, networking refers to information-seeking communication with a person or organization with whom a constructor has some sort of pre-existing relationship. The communication is usually face-to-face or by telephone. Contact through other means, such as an e-mail, is usually a precursor to a richer format.

By far, the most common networking relationship is that with other coworkers. This behavior is typically just an informal matter consisting of walking to another's office and asking a question. *"Networking is a huge, huge thing. I don't know how you do that except through the organization."* The selection of which individual to ask varies with the experience of the constructor. Novice wayfinders usually base the choice on proximity: they ask the person closest to them. As they gain experience, their network of coworkers grows and they can go to individuals who are most likely to be a good source of the particular type of information being sought.

> I know who to go to around here for about anything. One of the guys used to work on facilities side, one guy has a lot of [client name] experience, etc. A lot of it is based on what their experience was before [they came to that organization]—not just on who's next door.

Even if the first person does not have the information sought, the network can lead to the next potential source. Although intra-organizational networking is convenient, the important temporal aspect is noted even by inexperienced constructors.

> I'd go to certain people. You know who likes to teach and who's not going to sit there and try to teach for an hour. You know, I want a short answer—you know who likes to teach and who likes to talk. I've found my couple favorites and I go to them for questions.

External networking is also commonplace. Some of these external networks are based on contractual relationships. For example, a constructor would contact the roofing subcontractor for a question about how long the roofing will take to install—a type of preparing. In addition to current contractual relationships, external networks based on previous contractual relationships, past coworker relationships, and inter-organizational relationships are commonplace.

Network relationships can be personal, but not necessarily. Even networks that are several individuals "removed" are still used. For example, constructors call subcontractors who worked for their organization, even if they were not personally involved in the project. The network relationship is typically used as a key to open the discussion before the information is requested. "I wasn't even on the job, but I just called up [name omitted] and told him who I was with. It doesn't take much." One constructor related building these networks to assembling a library.

> You have got these old business cards of folks so when you need to go back and you don't quite remember who it is you have it…You begin building your own library of subcontractors and vendors.

Even competitors are sometimes networked if there is a personal relationship (such as a prior coworker situation), although there are limits on being able to use these sources.

Wayfinders also use many other types of networking. Trade organizations and professional organizations often provide a useful starting point. Family members are also used, particularly by novice wayfinders. "I use my dad a lot as a reference."

Networking uses an established relationship of some type to search for information. Since the network does not have to be personal but organizational, it can be effectively used by novice constructors who seek information through internal and external networks. However, constructors often must seek information in fields and geographical regions where they do not have any pre-existing relationship. In these cases, an alternative method must be used.

Branching/filtering

Branching and filtering are simultaneous techniques that are used to seek information in areas where the constructor does not have any existing relationships. Although constructors are relatively well-connected, situations still arise where there is no network to assist in the constructor's wayfinding efforts.

The wayfinder therefore uses his or her knowledge and experience to select a source, called a branch in this study, which has a high probability of leading to the actual information being sought. The distinction is small but important; the constructor does not look directly for the information, but seeks a branch that would be networked to the actual information. Sometimes this is a deliberate choice, sometimes there is no alternative. This branch is then used as a filter to select the best source of actual information. Examples illustrate this concept best.

> I got [sic] an example for you. I had this owner call me up on a Friday afternoon wanting an estimate for some demo job in Cincinnati. And he had to have an answer on Monday. So I walk around and nobody's here—they all cut out already for the weekend. So I'm like, 'We've never done any work in Cincinnati—how in the hell am I supposed to get a price for demo?' So I got to the idea of calling the dumpster guy, and it happened that he was also a demo guy. It was that easy. [I came up with that because] when a guy demos some buildings he's got to put them in dumpsters to get them to a landfill. So I figured, they always want to know what it's for—they would know who was using their dumpsters for demo and who [sic] I could call. So the dude was real cool and said he knew the exact spot I was talking about and that he'd drive by there over the weekend and have me a price first thing Monday morning. Just because I know about ordering dumpsters.

However, sometimes the branches are very deliberately selected. The next example is from a constructor looking for a concrete subcontractor in another state where he has no networks.

> Now let's say we're going to Boulder, Colorado to do a job and you don't know nobody [sic] in Boulder, Colorado. So, who's the first person you call? I'd . . . look up the concrete suppliers. Call them and say, 'Who's the concrete contractors that could do this job?' They are going to give you the names of people who pay their bills. They won't give you the names of bums who won't, right?

The constructor knows that a concrete subcontractor would have to purchase concrete from somewhere. The contractor uses his knowledge and experience of the industry to select the concrete supplier as a potential branch. The branch is naturally networked to concrete subcontractors in the region. The branch also filters the potential sources for the constructor by only providing names of subcontractors who paid their bills, a measure of their financial solvency and stability.

With a few more questions, the constructor can refine the list even further by providing details of the project so that the supplier can filter out subcontractors who might be too small or too large for the project. The constructor could go even further and cross-reference subcontractors through several suppliers and see if the same names keep coming up as potential good leads. Branching and filtering are advanced techniques typically used for sourcing by experienced constructors. The process is also a form of risk-managing and breeds efficiency due to its delimiting of potential information sources. It is an intermediary step that would then be followed up with a direct contact.

<u>Cost-saving</u>

A final approach of wayfinding by constructors is cost-saving. It is not a method of its own; rather, it is a selection process for choosing the most cost-effective approach with regard to time and accuracy. One participant related using the free services that come with being a member of a particular construction organization for legal advice instead of paying a lawyer in certain cases. This variety of tools and methods is employed by constructors to seek information successfully.

Types of Wayfinders

Although there are many different positions and titles in the construction industry, two basic types of constructors exist regarding the way that they seek information. The novice

wayfinder is relatively inexperienced and is typified by a young person entering the field, such as a freshly minted university graduate of a construction management program. However, age itself is not a property, but rather the level of constructing experience. The experienced wayfinder can draw upon his or her knowledge and background to seek information differently—and usually more efficiently and effectively—than the novice. This efficiency and effectiveness is a matter of degree rather than an absolute distinction; some novice constructors exhibit wayfinding actions of more experienced practitioners.

<div align="center">Novice</div>

The novice constructor wayfinder is relatively inexperienced at seeking information as a constructor. Although age may be a factor, younger people naturally have less opportunity to have considerable construction experience, it is not simply a matter of age. Experience is the deciding factor; more precisely, relevant experience is necessary. For example, one constructor tells how his organization, a commercial contractor, hired an individual with many years of experience in residential construction. The new hire had to essentially relearn information-seeking in this new realm.

Novice constructors are much more self-aware of the information-seeking process. They readily report that they spend more of their day looking for answers than their more experienced counterparts. "I feel like I'm asking questions all the time."

The wayfinding approach of the novice is often different than that of an experienced constructor. Physical proximity plays a key factor with the novice, resulting in him or her turning to the person at the next desk or cubicle first to seek information or answers. Efficiency, particularly with regard to speed, is a factor in this behavior. "I probably ask him [the person in the cubicle next to him] more than anybody."

However, proximity is a greater influence when those in close proximity to the novice constructor are also relatively less experienced. Novices change their information-seeking behavior to avoid potential embarrassment, appearing ignorant, or being considered a nuisance. Terminology is a common type of information that is sought by the novice using face-saving techniques.

> Lingo, as far as construction things go, sometimes I have no idea what people are saying to me. Like 'escutcheons' for fire systems. I'd never even heard that word before and it was brought up in a meeting and I couldn't even spell it and I was like, OK, I'm not going to look like I'm stupid so I wrote "e. . ." and rambled on in my notes and then went back and typed it in and learned what it was.

Another related using other sources to gain a basic understanding on a topic before bringing a question to others. These face-saving techniques are particularly employed when the novice's boss or superior is involved. "Yeah, you want to ask as few questions to your superiors as possible. You want to make sure you've explored every avenue to make sure that you can't get the information before you start asking around."

Unsurprisingly, novice wayfinders are delegated information-seeking activities more frequently; the reasons for their searches are commonly clarifying and sourcing.

<u>Experienced</u>

Experienced wayfinders are relatively well-versed in their industry, region, and information sources. These people are more seasoned constructors and still seek information as a regular part of their workday, but also spend a greater portion using the information than just seeking it.

They are also less self-aware of seeking information; for many, information-seeking has become so routine that it is simply accepted until probed. "I wouldn't say it's a big part of my day." After inquiring about some sourcing activities, though, he revealed that there were types of information that he did seek regularly. "Now pricing, that's a different story, more so than product data. I do that all of the time." Even experienced constructors are faced with wayfinding topics about which they know very little. Although their actions are sometimes similar, the approach is different from that of the novice in that the experienced constructor is unconcerned with saving face during the process.

Experienced wayfinders still seek information for some of the more basic strategies, such as clarifying, sourcing, and preparing, but they also search for information to confirm and manage risk. They employ more advanced techniques, such as branching/filtering and understand the interconnectedness of the industry system. Experienced constructors are more efficient and effective at finding accurate information; they have to be in order to survive in the industry.

Discussion

The demanding, fast-paced construction industry requires much from its participants. Constructors' main concern is seeking accurate information efficiently and effectively to compete in this field. This main concern is resolved through wayfinding using five interrelated strategies. This theory, called wayfinding, explains the reasons why wayfinding is performed, tools and techniques used, and the types of constructors who wayfind. The wayfinding process allows the resolution of the constructors' main concern of being able to find effective information quickly.

Implications of Wayfinding

Wayfinding offers a description of the process that constructors use to seek information. As previously noted, constructors are extremely busy and temporal demands are always a concern. Wayfinding offers a thorough, concise explanation of information-seeking behavior as a starting point for reflection and critical thinking as well as self-improvement. As Brookfield (1987) stated, "Learning to think critically is one of the most significant activities of adult life. When we become critical thinkers we develop an awareness of the assumptions under which we, and others, think and act" (p. ix). Constructors who understand their

metacognitive processes—and those of others—might be able to better compete in this competitive industry.

Wayfinding highlights the importance of the information-seeking process. Constructors recognize the processes described; they confirm and validate its current practice. For example, the value of networks is emphasized at personal and professional levels. This value might assist a constructor who is considering whether to join a particular organization or send in renewal dues for an existing membership. Wayfinding also offers a starting point for dialogue between and among constructors by offering a conceptual description of the process as well as common terminology. This discussion may be particularly beneficial to experienced practitioners, for whom the information-seeking process has become so familiar and routine that it is invisible. Educators of future constructors can help them understand the importance of seeking information as well as realistically prepare them for these activities, perhaps accelerating the transition from novice to experienced practitioner.

Novice constructors can recognize some of the more advanced techniques used within their organizations and can perform more informed inquiries regarding the reasons and techniques being used. They may also identify some of their assigned tasks as building their wayfinding skills and understand the value of them more readily. All levels of constructors can use the theory to self-identify strengths and weaknesses as a starting point or continuation of their professional development.

Additionally, other parties within the building industry should be aware of these strategies, particularly as these strategies might be used against them. For example, architects should be aware of the subtle difference between resolving and shifting when clarifying is used. Diligence must be exercised to prevent confirming from inadvertently usurping design intent. Constructors' superior knowledge of the impact of information on time and cost may lead to increased use of shifting, for example.

Wayfinding and Existing Theory

Wayfinding builds upon and is different than theories of information-seeking in other rather varied fields. Ellis (1993), in his grounded theory of information-seeking of academic researchers, quoted several academics who spent considerable time monitoring publications to keep current on a topic, without a specific piece of information being sought. However, effectiveness is a trait that is shared between wayfinders and some other academics. Bronstein and Baruchson-Arbib (2008) examined Jewish studies scholars and found that they preferred more effective methods of seeking information over those people that made the least effort, i.e. effective was preferable to easy. Wayfinders prize effectiveness and efficiency; however, efficiency is viewed with regard to time expended rather than effort. In other words, a difficult but quick approach would often be chosen over an easier but slower one.

In another field, Ellis and Haugan (1997) described the information-seeking behaviors of engineers and scientists in an industrial research setting. These researchers described browsing through scientific journals and catalogs, where, "They usually scan through all the publications to find something of particular interest" (p. 398). The engineers and scientists also look through patent literature, which might provide relevant information or confirm what information is not available (i.e., the absence of an existing patent on an invention or process). Again, this is notably different that the information-seeking of constructors.

While wayfinding describes how individual constructors seek information, it also hints at the potential of organizational knowledge management systems. Markus (2001) examined knowledge reuse and its implications for knowledge management repositories, and found that novices had different approaches for seeking expertise. Future researchers may explore the relationship between individual constructors' information seeking and construction organizations' knowledge management approaches. Duncan and Holtslander (2012) examined the information-seeking behavior of senior nursing students, who might be considered novices, and found that frustration with terminology was the main concern. Although wayfinding did not find frustration to be a main concern, several novices did describe seeking information on unknown construction terminology. Educators, in particular, may wish to examine these implications in their preparation of future professionals in these and other fields.

This author examined wayfinding—the information-seeking behavior of constructors, who are part of a larger process of building any type of structure. This process is one in which they are typically seeking information from architects, consultants, and other agents, whose interests may not be aligned or may even be at odds to that of the constructor. This type of information asymmetry has been shown to lead to opportunistic behavior in information systems consulting (Dawson, Watson, & Boudreau, 2010), and could be examined in future research that could explore how information is provided to constructors by other parties.

While this author focused on constructors, these same strategies may be also used in other business and personal interactions well beyond the construction industry. Additional research into other types of strategic information-seeking behavior is warranted.

Conclusion

Construction is a risk-laden, fast-paced business endeavor with information requirements inherent to its very structure. The author in this investigation showed that constructors' main problem is seeking accurate information efficiently and effectively. Cost and time constraints are major concerns that are often balanced against each other during the process. Constructors use wayfinding to seek relevant information quickly to resolve their main concern.

The theory of wayfinding explains how constructors seek information in their professional careers. Five approaches within the strategy family were discovered, some with additional conceptual delineations within the strategy. Wayfinding is conducted by adopting one of five strategies: clarifying, confirming, sourcing, preparing, and managing risk. Three techniques were found: networking, branching/filtering, and cost-saving. Wayfinding varied by two types of constructors: novice and experienced. Wayfinding is the selection of a strategic approach to seeking information to enable the constructor to proceed with accuracy, speed, and success.

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