

THESIS

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PROCUREMENT IN THE CONSTRUCTION INDUSTRY

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List of Abbreviations

BoQ	Bill of Quantities
B2B	Business to Business
B2C	Business to Company
BREEAM	Building Research Establishment Environmental Assessment Method
CDW	Construction and Demolition Waste
EDI	Electronic Data Interchange
EU	European Union
ERP	Enterprise Resource Planning
GMP Contracts	Guaranteed Maximum Price
ITB	Invitation to Bid
LEED	Leadership in Energy and Environmental Design
LoW	List of Work
R&D	Research and development
PPP	Public-Private Partnership
RFP	Request for Proposal
SP	Sustainable Procurement
UK	United Kingdom
US	United States
WELL	Well Building Standard
WWW	World Wide Web
XML	Extensible Markup Language

INTRODUCTION

Architecture has existed for as long as civilization. Its origins can be traced back to the Neolithic period, around 10 000 BC, when people stopped living in caves and began to organize and design how they wanted their homes to look. (Lee, 2016). Procurement is linked to architecture and can be traced back to ancient times, including the Egyptians in 3000 BC. The Egyptians used scribes to take note of the supplies they needed for their projects. Although procurement's organizational position was not fully recognized until the Industrial Revolution in the 1800s, one of the earliest acknowledgements of the procurement function can be found in Charles Babage's book, *On the Economy of Machinery and Manufactures*. Procurement gained prominence during the Industrial Revolution. Marshall Kirkman's book *The Handling of Railway Supplies- Their Purchase and Disposition*, published in 1887, provided extensive strategic procurement contributions to the railway industry, going into greater detail regarding purchasing goods from established areas of the country and transporting them to the south and west. (Nolan, 2020). In 1886, the Pennsylvania Railroad gave procurement a departmental status, 'Supply Department'. The procurement role was into actual organizations by the end of the century (Nolan, 2020).

Due to shortages from the Great depression and World War II, procurement became increasingly strategic and sophisticated in the twentieth century. Purchasing was considered as a significant and critical part of business operation during the war. Additionally, during this time the function was becoming more professionalized. According to Robert M. Monoczka, Robert B. Handfield, and Larry Giunipero's book, *Purchasing and Supply Chain Management*, only nine universities had purchasing programs in 1933. Forty-nine universities had them by 1945 (Stinson, 2021).

However, because of the World Wars procurement activities were 'forced' to shift away from a strategic role due to the scarcity of materials. During this time, procurement was focused on placing orders. The primary goal was to acquire enough raw materials, utilities, and equipment to keep the economy afloat. Procurement began to take on a managerial role in the 1960s, and this became the focus of this era. Since procurement professionals stressed competitive bidding, most contracts were decided based on price. Additionally, during this period, procurement was helped in regaining departmental status by an increase in qualified professionals. Because of the increased supplier rivalry in the 1980s, businesses had the luxury of focusing more on supplier quality and

dependability. In the late 1990s, procurement started the transition to strategic sourcing (Nolan, 2020). In addition to this, it must be mentioned that computers and computer networks aided a great deal in procurement and strategical sourcing. -This gave organizations a handful of new tools to utilize in the workspace and aid in communication and bidding (Stinson, 2021). Procurement officials viewed suppliers like partners and long-term contracts were supported. This was the beginning of the evolution of modern-day procurement. (Nolan, 2020)

Now, it is no longer just about moving products from point A to point B, it is also about comprehending and implementing a complex collection of variables. Global competition, shifting markets, and supply change differences that could arise have brought the need for procurement leaders to build strategies that can provide a sustainable long-term competitive advantage. As a result of these complex variables, procurement has changed from companies concentrating on purchasing products from the vendors with the lowest price quotes, to using the power of big data analytics and cloud computing to make better decisions (Viswanathan, 2019).

Today, procurement specialists are one of the most important aspects for a company. They are responsible for both optimizing costs in an efficient way and reporting savings achieved which leads to more advantageous benefits for the company. Being a procurement specialist includes negotiation huge cost contracts and introducing innovation processes. Procurement has evolved so much over the years, especially today it has become a vital part of the supply chain. Procurement might not be as attractive as a career in law or in medicine as a profession, but if one does decide to pursue a career in procurement, they will see that this sector has much to offer. Therefore, at the end of my research I would like to prove the hypothesis:

“The use of E-procurement in the 21st century is beneficial in the construction industry.”

I have chosen this topic for my studies because, for more than a year now I have been working as a procurement intern at a property developing company. I am also highly interested in the way a property developing company works, with all the procedures, thoughts, ideas, deadlines, keeping the project within the budget, communication and how every department works together. I have found that I am very interested and passionate about the work that is being done, and in addition to my day-to-day tasks there is always something new. In addition to this, I have received so much experience. Every day brings a new challenge, and a new problem to solve which has tremendously aided in my problem-solving skills and my ability to work in a team. In this study I

wanted to get a higher knowledge of the processes in a property developer company, not just the procurement process but approval processes, financing, communication, and construction. Procurement is starting to get rather popular in company life and in the economy. More so chief procurement officers are becoming more important in the boardroom.

I will be writing about the procedures in a company and what the process looks like once a company decides to take on a project. I will get into decision making, planning, permission planning, tender planning finding contractors, writing contracts and the construction itself. The process and importance of procurement is what I will be analyzing in more detail along with e-procurement and sustainable procurement. I will be using research materials from online sources such as articles, and journals as well as gathering information from my colleagues. I will also be interviewing my colleagues, as my primary research, who work as a part of the procurement specialist team to get a better knowledge about their opinions, experiences, their reasons for why they chose this field, and their overall feelings about procurement. I plan to conclude this study with the results of my primary research and some of my thoughts and opinions.

1. FEATURES OF PROCUREMENT

In all organizations and companies' procurement has a big impact on the outcome and result of a project. It is a good idea to practice strategic planning of procurement to connect procurement activities and priorities to the overall priorities that a company or organization could have. Strategic planning is advantageous to manage the risks and costs that are involved in procurement (Interagency Procurement Working Group, 2006). However, it is important to know that procurement is not just about obtaining goods and services. In the procurement department it is important support operational requirements, this means to understand the business requirements and purchasing products and services accordingly. This includes purchasing the products and services at the right place, from the right source, at the right specifications, right quantity, and at the right time (University, 2011). Purchasing in the procurement sector for internal customers include manufacturing, physical distribution centers, engineering and technical groups, R&D, information technology, and transportation and other services (University, 2011).

Another goal is to control the procurement process and supply base efficiently and effectively. To do so, the procurement department must take the following steps: define prospects, coordinate organizational processes, and meet the goals. In the department of finding prospects, the procurement team brings real value. This is where procurement experts assess and choose suppliers. Although the evaluation process is lengthy, it ensures that a qualified supplier is selected (University, 2011).

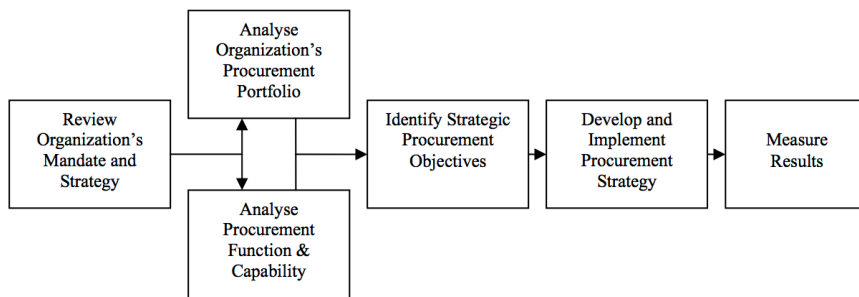
Management of internal operations include management of procurement staff, developing and maintaining policies, providing leadership and methods to grow for employees, and defining the procurement strategy, structure, measurement, and plans. This is achieved through leadership of procurement for the organization, sourcing management, ownership and accountability, communication, collaboration, and teamwork (University, 2011).

It is also important to develop strong relationships with other functional groups within the organization and support organizational goals (University, 2011).

It is the responsibility of organization of senior managers of the organization in addition to the chief procurement specialist to develop the procurement strategy. However, it is done with the procurement specialists so the different types of analyses can be taken. Typically, this is done with

the company's business planning cycle, and it is either done annually or on a biennial basis. The procurement strategy or procurement plan is developed by taking the following aspects into consideration: mandate, strategic direction, objectives, procurement portfolio and procurement function and capability. By taking these analyses into consideration the company can develop the procurement plan and implement it as well (Interagency Procurement Working Group, 2006). In the figure below, the different stages in this process are shown.

Figure 1. Procurement plan/strategy



Source: (Interagency Procurement Working Group, 2006)

The main objective of procurement is to give the organization value to fulfill its goal and objectives. It is important to make sure that the procurement plan is in line with the mandate and strategy of the organization. The form of the organization and mandate is different for every company, but some cases can involve reviewing material and certain documents like business plans or strategic communications from senior management (Interagency Procurement Working Group, 2006).

To develop a procurement plan it is important to analyze the procurement portfolio. By doing this the procurement department is going to receive a full and comprehensive profile of the procurement needs of the organization. This usually contains three steps; the first step is to inspect the contents of the spending analysis. This consists of analyzing past and projected procurement costs spent on goods, services and works. The next step is to analyze the complications that can arise in securing these goods or services and works. The third step is to form a matrix that contains a developed procurement profiles that identifies the past and projected procurement costs and associated levels of the risks (Interagency Procurement Working Group, 2006).

The concept of procurement has always been around, even though it was not called procurement or regulated the same way as it is today people and businesses always needed to

purchase materials, goods, and/or services. The concept of procurement can be traced back to the 1800's when the procurement specialists were called "Materials Men" (Procurement, 2018) . For example, Rome could not have been built without some type of procurement system. The work needed suppliers and people who would work on the project. Considering that this project was built many years ago the practices they used were most likely much simpler than the practices we have now, they were still able to complete something that still stands today. This shows that many years before modern technology and a strong supply chain could be a reality (Achilles, 2016) .

Over the years procurement evolved. One of the most important changes procurement experienced was a development of a more strategic supply chain management strategy. To keep the supply chain risk to a minimum a proper strategy is needed, this is especially important if the company's supply chain plays a part in the day-to-day life. The next major factor that changed procurement was technology. New ways to manage supplier data came to life, this allowed buyers to find out more information about potential suppliers with tools like the pre-qualification questionnaire. These changes brought a lot of solutions to problems the procurement sector had. One of the most significant changes that changed the practice of procurement was digital technology. The next change might seem a bit strange, but a change that helped evolve procurement was the abolishment of slavery. This is one of the most recent developments in the evolution of procurement. Slavery has been around since ancient times and even though it was abolished in the 1800s modern day slavery still exists around the world. The Modern Slavery Act was introduced in October of 2015 in the UK and this was a key step for the future of supply chain management. In this act it is said that if a buyer's supply chains have modern day slavery the company could face serious penalties which would leave the company's finances, reputation and legal standing damaged (Achilles, 2016).

Due to the recent economic shutdown, there has been an increasing importance for the procurement function. The economic shut down has led to companies needing to reduce costs, retain clients, and gain a competitive advantage, both of which have resulted in significant improvements in the role of procurement in industry. The amplification of procurement has also been aided by the economic market and the push to outsource non-core operations. Procurement is now perceived as a critical strategic partner who has cutting edge procurement competencies that provides competitive differentiation, instead of being viewed as a clerical function

(Procurement, 2018) . “In my view, procurement has now evolved into a critical management function that will continue to grow in significance.” (Usifoh, 2018)

1.1. The Importance of Procurement

Procurement is a vital part of the supply chain of a company, and when it is done right the way company can save money. The procurement process will allow the project manager and procurement specialists to find the supplier that will fit the needs of the company in addition to offering the best value for money. If a company, not just a construction company, does not have a procurement department or team the project will not go forward. “If we do not buy (or grow) potatoes we cannot cook” ((Fekete, 2021). Procurement is very important, but it is only one part of the supply chain for the result. It is part of a complex process (Interview with Fekete Hajnalka, 2021). The process of procurement is based on the procurement plan to make sure that the procurement specialists order the materials or labor that the company requires for the project to be done in time, with the right quality, and the right price (Bicsérdy, 2021).

Figure 2: Construction Procurement steps



Source: (Editorial team, 2020)

Being a procurement specialist comes with many advantages. This sector can offer a wide variety of projects. Designing more efficient supply chains, collaborating with people from different companies and sectors and this results in many contacts in different sectors. However, even though that working in the procurement sector has many advantages it can also be challenging career path. It will most likely happen that you will deal with difficult suppliers, or a company merger and these situations can be very testing. In addition to this it can be difficult to handle all the tasks that are assigned to the specialist. Also, because of the overwhelming number of tasks it

happens often that other specialists want something done right away because of a deadline, and they aim their frustration towards their colleagues (Fekete, 2021).

There is more than one way to procure. The primary types of procurement are, general contracting, design and build, construction management and management contracting. Choosing the right approach is critical for the success of the project and company. General contracting is when the contractor agrees to work with the design that has been provided by the company, this is the traditional procurement method. In this case the contractor only has responsibility over the work he is doing at the construction site (Richards, 2006). The price which is contracted is based on the BoQ that is provided by the company, and in this BoQ every aspect of work will be specified. This approach also provides the developer with the benefit of having an independent professional oversight of the project in the capacity of contract administrator. However, one of the most significant drawbacks of general contraction is the separation of construction and design responsibilities. This can and most likely will lead to disagreements about whether the defects are design flaws, which in this case is the responsibility of the developer, or if the defects are from the materials or the workmanship, which in this case it is the responsibility of the contractor (Richards, 2006).

Design and build has many different types, typically in this case the contractor is the one who takes responsibility of both the design and construction. In design and build contracting the contractor creates the design and builds the building based on the developer's specifications. Turnkey contracting is a type of D&B contract, but they are not the same (Richards, 2006) Turnkey contracts are defined by the fact that upon completion the contractor should be able to literally "hand over the keys" to the owner, who should then be able to operate the project in question. However, this type of contract is usually associated with power plants or works that have a heavy engineering element. The main advantage of this type of contract is the fact that the contractor has responsibility for the design and construction. This type of procurement is becoming more and more popular. A disadvantage of D&B is losing the owner losing control over the design (Richards, 2006).

Construction management is where the construction manager is the one to manage the works for the principal. In traditional construction management, the construction manager is appointed as the principal's representative to oversee and supervise the project's construction on the principal's behalf. Contract management projects are advantageous for projects that are fast-

track, the construction manager can be involved before the designs are ready. In addition to this the principal always has control. However, the final overall cost of the project may not be known to the principal until later in the project (Henry, 2019).

A management contract is a type of outsourcing agreement, where a third party will be hired, and they will be called a management company. This company can manage the project in question, and function or work department for the developer. An advantage of this approach is that it saves capital, provides business continuity, provides expertise, and saves time and resources. However, a very big disadvantage could be that the developer must let go of the control, and hand it over to the outsourcing company. In addition to this there is a danger of reputation damage, and it is possible that there could be a conflict of interest with the company you are outsourcing to. This type of contract is good for those who have a lot on their plate and are looking for management help (Thompson, 2019).

1.3. Procurement Specialists

Procurement specialists start work before the construction process begins, this is mainly so the construction can begin. The procurement specialists must also have some sort of logbook. There must be a way to record the contract, the content, what is it about, how much the contracted fee is and other specific data concerning the construction. Each company has their own type of logbook that was created specifically for the use of said company. The main requirements for programs like this are a way to record a bill of quantities (BoQ), the supplier and all information concerning their company, and the contracted amount. Furthermore, after the contract and bill of quantities have been approved by the necessary personnel, the program will generate a List of Work. This is used to issue a Performance certificate which will start the payment process of the supplier. This List of Work will be sent to the supplier for them to fill out the works that have been completed to which they will send it back to the company, and then based on this, this is how they will receive their payment for the works done (Bicsérdy, 2021).

The number of procurement specialists a company needs is based on the size of the company, but one is needed for each area, an engineer is needed for the following sectors: structural architect, an engineer who works on the façade, an engineer who works on the mechanical, and finally electrical works. Each procurement specialist has basically the same task. Pre-qualification of suppliers is a process in which suppliers of a specific product or service are evaluated against pre-determined requirements, and only those who meet the criteria are invited to submit a bid. (State

of Queensland (Department of housing and Public works, 2018). This is useful because when one uses the method of prequalification of suppliers, they can provide objective, quantifiable data to support the decision-making process, in selection, receiving standards of performance from the suppliers, differentiating suppliers as a basis for getting the best match between suppliers and government contracts, encouraging development and improvement, and enhancing the security of payment. (State of Queensland (Department of housing and Public works, 2018). Compiling of inquiries, this is important because missing information can lead to project delays, failure, uneconomical decisions. Making BCT's are important as well, because building technology includes compiling a list of materials and their application, physical properties, vulnerabilities and capabilities, the operation of components and systems, operating strategies, and the principles, the procedure, and the details of construction. (Anon, 2016) . Writing the construction contracts is also the procurement specialist's responsibility, but because all projects ever created are different, they will individually need a different type of construction contract that will satisfy their needs as well as the contractor's needs (Sjerps, 2021)

There are five main types of construction contracts: lump sum contracts, time and material contracts, cost-plus contracts, unit price contracts and GMP contracts. Lump sum contracts are fixed price contracts, basically this means that there is a fixed price for the work that must be done, lump sum contracts are the most common type of contract in construction. (Finly, 2019)

Lump sum contracts are financially pleasing for the employer because the price is set and this means that the project will finish under budget, and the company will have high profit margins. When using this type of construction contract, it is important to pay attention, because miscalculations can happen, for example if there is an unexpected setback then there is nothing to cover the cost of it. So, in conclusion lump sum contracts are usually the best for smaller projects that have a predictable scope of work (Finly, 2019).

Time and material contracts are best for those projects that do not have a well-defined scope of work. These contracts are used to reimburse contractors for the cost of the materials they provide and set up an hourly or daily pay rate. This type of contract is advantageous because if there is an unexpected setback or a delay the changes can be added to the scope of the contract. Although when using a material and time contract it is terribly time consuming, logging each material cost is a huge task and responsibility. If the employer does not track the materials accurately then this can lead to a lower profit margin. In addition to this, since this type of contract pays hourly or

daily, there is no real motivation to finish the project quickly, but it is very common to offer a bonus if the project is finished before schedule (Finly, 2019)

The next type of construction contract is cost-plus contracts. This type of contract is a cost-reimbursement contract, the owner pays the contractor for the cost that arose during the project and a set amount of money for profit, this can be determined by a percentage of the total price of the project. Cost-plus contracts are flexible, and this is good for two reasons, the first one is that this allows the owners to make changes along the process of the project and the contractors know that they will get paid for over time or changes in materials. The second reason is that since this type of contract is flexible, if a mistake is made or there was something inaccurate in the primary bid it is easier to change than in a different type of construction contract (Finly, 2019). Although these are two very favoring aspects in a contract there are a few negatives for example, with this contract type all the materials must be justified, and it can be hard to account for every single item or piece of material that was used, which would lead the owner to be resistant in paying the costs. In addition to this, signing with a supplier by using this type of contract could put the contractors in a hard situation, because they will have to obtain the materials before they are paid which is a little bit risky financially. Most of the risk is put on the owner though in this situation because, once the contractor has finished the job, they will get paid in full but if anything, unexpected happens then the owner will be the one who must pay for it. Considering all these aspects the best types of projects to use this type of contract is one that has a lot of creative flexibility (Finly, 2019)

Unit price contracts are used when the contractor provides the owner with price offers for each unit of work and not for the entire project. Unit price contracts are financially favorable and safe because the owners will get a good idea of each price that goes into the final price of the contract, this will help with arguments when the time does come to pay because the costs, they will see that each price was predetermined. Also, if more work will be needed the profit margin will stay the same because the extra work that will be needed can be added on as a new pre-priced unit. This makes it easier to manage the amendments. At the same time trying to predict the total value of a project is rather difficult, because the number of units needed for a certain area may be more than expected and this will lead to the owner paying more. Remeasurement, or in other words the owner's ability to measure each unit price with the total cost of the project, could be time consuming. In this type of construction contract the weight of the risk will be on the shoulders of

the owner because they will have to reimburse the contractor for each unexpected unit that is added (Finly, 2019)

The last most common construction contract in this list is GMP contracts. GMP means guaranteed maximum price. This type of contract establishes a cap on the contract price, this means that the owner will not exceed the contracted price. This type of contract can be included in other types of contracts as well for example, a cost-plus contract could include a GMP provision by putting a clause in like this will limit the total costs. Agreeing to use a contract like this type will ensure a faster time schedule because the lenders will know ahead of time how much the maximum price will be (Finly, 2019). Also, having a fixed cost will motivate the contractors to reduce their costs to finish ahead of schedule. Unfortunately, if the contracted price is exceeded then the contractor will have to pay for the extra costs. So, when using this type of contract, the bearer of the risk is the contractor because the owner will not pay for the overrun costs. In addition to this it takes more time to go over and analyze the contents of a contract like this, because the owner is trying to protect themselves from exceeding the price cap but, the contractors will try to increase the maximum price, and because of this the negotiation process will be much longer (Finity, 2020).

Taking care of variation orders is also very common. An alteration order means the change in the scope of work which can be due to a variety of reasons. The owner not being satisfied of the delivered works, there is a need for extra works, or a variation order can also be prepared for non-performed works. It is very important to keep track of a contract that has amendments because it can be very confusing and can cause disputes between contractor and owner (Sjerps, 2021).

A procurement plan is essential when working on a project because this will determine the requirements, time schedule, materials and services needed. A procurement plan should always be flexible in case there is a change in the time schedule or the required materials. The plan will determine which materials need to be procured, how the contracts will be approved, risk identification, it will determine the price of the procured products and services. It is part of the project manager's job to clearly determine the project from the beginning till the end and manage it as the project goes forward. This way the project manager can ensure that the procurement team will understand the steps that will take the project from beginning to the end. It is the project manager's goal to keep the project on track and easy to manage so those that are in the procurement team will not become overwhelmed (Concord Editorial, 2019). A good procurement plan should meet the company's needs through a smooth supply chain flow. To have a successful procurement

plan process the business must follow procurement planning requirements. The first step of a procurement plan is to gather the items that will be procured in specific terms. Every detail is needed, the details of the items, sizes, color, material and so on, in addition to this the service it will provide needs to be justified as well. If there are any other relevant technical information that is important to the procurement process it should be listed here (Concord Editorial, 2019). Next the dates must be specified for when the items/materials will be needed. Each item will have a different date because it will be required for a different step in the construction process. It should be known that there is a list of specified procurement specialists who can order the required items, this will make sure that there are no misunderstandings (Concord Editorial, 2019).

Step two is to determine which type of contract to use. The contract is an agreement between the two parties engaging in a work relationship with each other. I have mentioned the types of contracts previously. The company and the supplier will choose the type of agreement that suits their needs in the best way, making sure that there will be no disagreements between the two parties. At this point the specifics of the contract management details should be discussed as well. This usually includes the contract management platform that will be used, the signature requirements, approvals, and the management of the contract after it has been signed (Concord Editorial, 2019).

The third step is to identify the risks, all projects have risks, and it is important to identify them before the project has begun. The risks could threaten the timeline of the project, and it is the project manager's job to identify the ones that could be related to the procurement process. Some possible risks could be conflicts with the supplier, unrealistic timeline for the project, idealistic cost expectations, shipping delays, and a supplier's capability or incompetence to meet the deadline or perform up to promised standards (Concord Editorial, 2019).

Step four is to mitigate the risks; a procurement plan should usually have a section to mitigate any of the identified risks. For example, if there is a contractor who does not complete their part of the project like the agreement says, there should be a replacement contractor who the company can call (Concord Editorial, 2019).

Step five is to determine the costs by outlining the costs that will be associated with the project. This step is very important because every company has a budget that they would like to adhere to. Most of the time for procurements the company will issue a request for proposal (RFP), this will outline the needs, and asking for the suppliers to provide bids. In their responses they will provide

what products or services they can offer, how they will do the work, their experience, schedules, and a precise outline of their costs (Concord Editorial, 2019).

Many procurement specialists prefer to use forms that are standardized because this will help the project to be managed easier. This is step six, to identify which forms are to be used. The identification of this will help the process to go smoothly and ensure that there is unity between the groups who are working together on the project, simplify the whole process, and make the ongoing management of the process simpler. A contract management platform should have a function to create forms that people within the organization and third parties can use in the procurement process. For every company, the contract management platform/platforms are different but, the main functions should include a way to record the supplier's name, the country where the project is happening, the description for the scope of the contract, date of signature, the contracted amount, and which part of the project has been completed or will be completed (Concord Editorial, 2019).

Step seven is to find out if there are any restraints. If they are not recognized early on, then they can delay the successful completion of the project. Once they have been identified they should be taken into consideration for every step of the project until it has been completed. For example, if the time schedule is non-negotiable then it should be stated in this section, and everyone working on the project will know that it has a deadline and it should be taken into consideration during the process. Some other restrictions in a project could be price, limited resources, and technical difficulties. (Concord Editorial, 2019)

Step eight is to outline the process in which the contracts will be approved. The first steps will lead to approval, this means to review all the bids and proposals, in addition to a service and cost analysis. The contract lifecycle management platform will include the names, roles, and order where the decision makes will review and approve or send back the contracts. If the contract is sent back during the workflow this means that some part of the agreement is not correct, and it must be fixed for the decision maker to approve it. Having an approval workflow in a contract lifecycle management platform will ensure that each contract is reviewed, by multiple people sometimes, and approved in the right manner (Concord Editorial, 2019).

Identifying the decision criteria is step nine in the procurement plan. In this step the company should outline the criteria which the review board will use to decide which supplier to

select. Items like the supplier's capability to keep up with the schedule, price, quality, performance, and compliance of each supplier to the RFP will impact the final decision (Concord Editorial, 2019).

Finally, the last step. Step ten is to create a supplier management plan to keep track of the suppliers and the products of services they have provided. Drafting an outline of all the suppliers with their products or services to make sure that they are delivered according to the time schedule with the right quantity and quality. It is also a good idea to include how often the project manager should meet with suppliers, how and when such meetings should take place, what the meetings' aim should be, and what these meetings should achieve. These meetings are beneficial since they keep the project manager informed about the status of the purchased goods or services. It's a good idea to create performance metrics for each supplier. By doing so, the supplier may be evaluated based on the quality of their product or service, their ability to produce goods on time, and the overall cost. When an organization is planning a potential project, evaluating these metrics will help recognize areas that need to be changed, as well as assist in the selection of vendors (Concord Editorial, 2019).

1.4. Risks

A procurement specialist is especially risk averse person. To have a smoothly functioning procurement process, a reliable work relationship is needed with suppliers, the entire procurement team, and customers. Once a procurement specialist understands and manage the risks, they can streamline the procurement process and learn to manage and reduce them. It is important to know the weight of the procurement process. When procuring materials or labor it is important to calculate the risks. For example, if the supplier is late with the materials or even the labor it can lead to wasted hours and materials (Deshpande, 2021).

There are many types of risks categories when it comes to supply management. Five risk categories were presented that are linked to purchasing and sourcing: disruption of supply risk, price risk, stock and schedule risk, technology risk, and quality risk (Hallikas & Lintukangas, 2015).

Some other common types of risks include inadequate knowledge of what the company needs, poor supply chain management, inefficient contract management, improper communication, and unethical practices. As a procurement specialist it is crucial to the supply

chain to know when your company will need the materials or labor. There are several areas where problems can arise. For example, if the needs are overstated or underestimated, if the schedule is unrealistic, or if the budget is insufficient. These problems can lead to a waste in time, materials, labor, and capital. In addition to this if the budget is inadequate trying to connect the budget to the spending can prove to be very difficult. Overspending can have a huge impact on the project and the company (Price, 2020).

If a company has a poor supply chain process, maverick spending can easily pass unchecked and drain the company's finances. Maverick spending means purchases that are made outside of contract agreements. These purchases can be very costly to businesses (Dene, 2017). Poor supply chain management can also be visible in a company if it does not have a transparent vendor evaluation method, or a clear method for making purchases, requests, approvals, and payments (Dene, 2017).

If a company has insufficient contract management, then potential partnerships might fail. Contracts are basically agreements between two parties and if they are drawn up and written properly, they can lead to the potential partnerships being beneficial which will mitigate risks and save money. If a company does not have reliable vendors facilitated by stable and well thought out contacts, the company could have a delay in their project (Price, 2020).

Procurement specialists are usually in close business relation with the finance department. The procurement specialists must work hand in hand with the finance team because the specialist and the finance department will communicate what will be procured, how much of it and most importantly the price. Then they will put in a purchase request and the finance department will communicate with the stakeholders in the company to approve the purchase request. If there is a miscommunication about the number of items, delivery times, or invoice mismanagement this can lead to a delay in the project and damage the reputation of the company. This brings a danger of jeopardizing the relationship between the supplier and the company (Finly, 2019).

Unethical practices can be pursued in basically any department. For example, the finance team has many transactions throughout the day every day. There are many ways that the finance team can do unethical things, like fraudulent transactions. In addition to this, numbers can be faked by creating a purchase order that is fake, writing false information about the price, a false record of bookkeeping can be created, invoice fraud, embezzlement, and money laundering. It is also

possible that suppliers can offer the finance team gifts, taking them to dinners or lunches so that they get the special treatment as a supplier (Finly, 2019).

To mitigate these risks and problems, the first thing that needs to be done is to analyze the company's needs for example, create a realistic budget that will match the spending habits and utilize modern technology. A strong procurement software package will make it easier to track and analyze data for purchased items. If a company does choose to use a procurement software it will make for an easy set-up for a supplier portal, where the offers will be shown, and the automated supplier management and evaluation will help the mitigation of supply chain risk (Price, 2020). In addition to this, a software like this can aid or eliminate the risk of maverick spending. It does this by defining and assigning the roles of each stage of the procurement process: requests, approvals, and purchasing. It can also be expected, if a company implements a software like this, that the streamlined strategic sourcing will negotiate better deals with suppliers (Price, 2020).

Procurement software will also aid in effective contract management. Procurement software will usually have a centralized document library which will make it easy to view the contracts that have been recorded, the suppliers and transactional data. Since procurement is becoming more and more important in a company risk mitigation is a very important step in the process. Furthermore, it is very likely that the process automation and the utilization of technology will aid and boost a company's efficiency, transparency and help save money (Price, 2020).

However, since traditional procurement is one of the most common approaches in the construction sector, it is important to mention it. With this approach the work done in the design sector is separate from the construction work. There are two teams, not in any order the first one is where the developer hires an architect to do the designing and come up with the building specifications. The second team is a consultant team, whose job it is to take control of the design and the costs. When the designs are ready, the developer will create a tender for contractors, to find the contractor or contractors who will carry out the works. After this the contractor will prepare their price offer based on the specifications and drawings of the documents that were provided in the tender. When a company is using this type of approach, the contract is usually given to the candidate with the lowest price. The contractor will have to take all the responsibility for the works that will be done, along with the materials that will be used (University, 2013). The client, or developer has contractual relationships with all the parties, and this means that the client

has a closer control of the project. A few advantages of traditional procurement are high quality work because, the client has a tight control of the project, the participants of the tender will produce their price offers based on the same information, and the traditional procurement approach is easier to adopt than other types of methods. However, since everything has an advantage, traditional procurement also has disadvantages. For example, the developer might find it hard to keep up with everything, because he or she will have to communicate with several contractors at the same time. Another disadvantage is that using a traditional method is time consuming, the reason behind this is that the tender that is started for design is issued separately, and the tender for construction will only be started once the design tender has been completed (University, 2013). Additionally, with traditional procurement three types of contracts are used, lump sum contracts, measurement contracts and cost reimbursement contracts. When using the traditional procurement approach, it is important to consider the fact that a lump sum contract needs a complete set of documents before the tender starts (Davis, 2004).

The traditional procurement method is suggested for those organizations where their time program allows it, consultant design is needed, the client has the interest of appointing designers and contractors separately, prior to the start of the project, the price certainty is needed, product quality is needed, and the risks are placed between the client and the contractor (Bicsérdy, 2021).

2. E-PROCUREMENT

E-procurement is a B2B software solution that is provided as an additional service by large ERP (enterprise resource planning) providers or as an e-procurement software by vendors. Traditional procurement involves paper-tracked operations (Sidelnikov, 2020). Thanks to the ever-evolving world, the internet has become an essential commerce channel and the e-procurement software system is used online. There are many types of e procurement solutions available on the market, but all of them promise the same things, optimizing supply chain processes, automating business processes, like order processing and e-procurement solutions can offer a better relationship between customers and suppliers. This solution is cost effective that helps streamline purchasing processes which will eliminate paperwork that is non-essential (Sidelnikov, 2020).

E-procurement includes electronic data transfers that support operational, tactical, and strategic procurement. This means that e-procurement has been around longer than the term itself. After the Internet was set up in the 1990s is when the term e-procurement came into usage. From the 1960s till the mid-1990s, e-procurement took form of electronical data interchange (EDI). Today e-procurement is used with the help of the internet. The following steps of e-procurement timeline: traditional procurement, electronic systems to support traditional procurement, usage of internet at communication to support traditional procurement, internet tools and platforms to aid traditional procurement, and lastly internet tools and platforms to replace traditional procurement (Interagency Procurement Working Group, 2006).

Those who are involved with procurement need to understand e-procurement concepts to aid in their development, use, evaluation, and refinements as a way of improving procurement efficiency and effectiveness. Procurement specialists can help with decisions about investments, configuration, and the use of e-procurement tools in the following way: having a basic knowledge of e-procurement applications, identifying procurement processes that are supported by e-procurement, understanding the sources of the e-procurement benefits, acknowledging and knowing the risks that are associated with e-procurement, and contributing to the development of e-procurement by using the scope provided for e-commerce supported process improvement (Interagency Procurement Working Group, 2006).

The following are some e-procurement tools and applications: electronic systems to support traditional procurement, EDI, ERP systems, internet used to support or compliment

traditional procurement, web enabled EDI, extensible markup language (XML), WWW (world wide web). Electronic systems to support traditional procurement include mainframes and personal computers (PC), EDI and ERP. EDI is an application that can be used to send electronic messages between two computer programs of two separate companies. Some of the features are: messages are exchanged in groups, called batches, messages can be automatically sent, transmitted and stored between companies without having the need to retype the data, EDI costs can be relatively high because it has to be implemented separately by the two companies who wish to use it (sender and receiver), EDI is mostly used for messages that are about orders, confirmations, transport information and invoicing and EDIs run on Value added networks that are closed networks, not like the internet because the internet is an open network (Interagency Procurement Working Group, 2006).

ERP systems are management information systems that typically handle the manufacturing, logistics, distribution, inventory, shipping, invoicing, and accounting for a company. ERP systems assist in the control of many business activities such as sales, delivery, billing, production, procurement, inventory management and human resources (Interagency Procurement Working Group, 2006).

The next category is using internet as a support or a compliment to traditional procurement practices. Email is an internet-based application, where the electronic messages are traded between people. A web enabled EDI is like a traditional one, but using the name web enabled, it runs on the internet. XML is used to make the interchange of documents online easier. The WWW is the world wide web, and it is made up of Web servers that store and disseminate web pages which have documents that contain text, graphics, animations, and videos to anyone who has a connection to the Internet (Interagency Procurement Working Group, 2006).

E-sourcing, e-tendering, e-auctioning, e-ordering and web-based ERP, and e-information are all internet tools and platforms that replace traditional procurement. E- sourcing can be used to identify suppliers as a pre-qualify that is used in the selection phase. This is beneficial for both buyer and supplier because for a supplier it can be marketing, and for a buyer the benefit can be facilitating the sourcing of suppliers. A good example of an E-sourcing tool is the UN Global Market Place¹ (Interagency Procurement Working Group, 2006).

¹ You can view this by following this link: <https://www.ungm.org/>

E-tendering has been mentioned previously, but basically e-tendering supports the selection stage between the company that is procuring and the suppliers that are applying for the tender. It is a communication platform. This covers the whole tendering process, and it usually includes the analysis and assessment activities, however it does not include closing the deal with the supplier but instead facilitates a large part of the tactical procurement process. This will make sure that there is a fair treatment of suppliers, transparency, reduction in errors and legal errors, clear audit trail, higher efficiency in the tactical procurement process, and it aids in efficient time management of the tendering processes and procedures. Some UN organizations have implemented the use of UNDP-IAPSO and UNHCR for long-term agreements for vehicles, tents, motorcycles, and pharmaceuticals through an in-house developed tendering portal (Interagency Procurement Working Group, 2006).

E-auctioning aids in the contract stage. It allows the deal to close with a supplier if both parties agree on a price. This method uses an upward or downward pricing system. For example, if the e-auctioning is using the upward price method it means that they are auctioning for the selling organization, but if they are e-reverse auctioning with a downward price method its for the organization that is buying. E-auctioning can be made with traditional ITB/RFP, but they are used with internet based open or closed systems (Interagency Procurement Working Group, 2006).

E-ordering and web-based ERP are used for the creation and approving of procurement orders, making purchase orders, and receiving goods and services ordered. E-ordering is usually used for indirect goods and services, and ad-hoc ordering used by all employees of a company. Web-based ERP is for direct goods and services for planned ordering, and it is only used by the procurement department (Interagency Procurement Working Group, 2006).

E-informing is not directly connected with a stage in the procurement process. It is the process of collecting and distributing information from internal and external parties and using the internet (Interagency Procurement Working Group, 2006)

2.1. Benefits

E-procurement can provide a greater transparency in the public sector in procurement through electronic publishing of tender notices and contract awards. Taking this into consideration it will help with accountability and reduce the instances of corruption (Interagency Procurement Working Group, 2006). In addition to this using an e-procurement software makes it easy to track

a PO or an invoice, and with analyzation it is easier to improve the company's processes. A software like this will also give more control over every part of the purchasing process. The input of an order, who can approve it, who can purchase, who will pay it, the transaction detail and much more can be controlled. It is easy to keep track of the suppliers who are in relation with the owner company. Budgeting is made easier with e-procurement because the system can also be capable of letting the users know the available budget, also the system will not only alert the approvers if the request is over the budget, but the system can trigger routing rules or approval workflows, to make sure that they are properly accounted for. E-procurement will save the company a lot of time and money as well as many more benefits (Jandrell, 2020).

2.2. Risks

Like everything e-procurement has risks too. One of the first risks that can arise is missing opportunities to use strategies that improve the procurement management without having to invest in the e-procurement software. The reason for this is that all the benefits that are promised to come with e-procurement can be achieved by improving the procurement practice. An example to this is the statement that "e-procurement reduces maverick buying", but for instance there are companies that implement corporate buying strategies that offer money for value, they do not use or need electronical tools (Dene, 2017).

Over-investment creates risks in an e-procurement because the software might not deliver the expected benefits. This risk occurs when the evaluation of the adoption or use of the software is inadequate, and this could lead to inadequate use of the software. In addition to this there is the risk of users not wanting to accept e-procurement tools. This is when the potential user or users are not properly informed and consulted about the software and how to adopt or welcome the tools to their organization (Dene, 2017).

Inadequate use of e-procurement software can be classified as anything that is not following the instructions of how to use the software. This can mean many things, for example leaving out a certain step in the workflow or not utilizing certain features that are important in the process for recording the data, not using the software to its maximum potential. Additionally, it can happen that when a colleague received the training for said e-procurement system they delivered the information about the use of the program incorrectly (Bicsérdy, 2021).

There is also the risk that the suppliers will not want to cooperate with the use of e-procurement. It could easily happen that a supplier does not want to participate in an e-reverse auction due to the market and the already competitive low margins. Some may not have accessible internet-based technology that would grant them access to the e-procurement tools. In some cases, suppliers may insist on the use of paper-based systems (Interagency Procurement Working Group, 2006).

A few other risks can be mentioned, for example, computer viruses, unreliable internet services, hacking, electrical problems, un-ethical financial transactions and so on. These risks can be mitigated today relatively easily thanks to modern day technology. For example, if a user wants to protect their software from a bug or virus, it is usual and most of the time it is compulsory for a company to have a fire wall to protect company data. If a company is having an unreliable internet service, most of the time the company will fix the server that the company operates on. Electrical problems will have to be fixed by an electrician. To keep track of un-ethical practices, it should be important to the company to request reports of funds and transactions that should be looked over to keep track of unusual activity (N, et al., 2017).

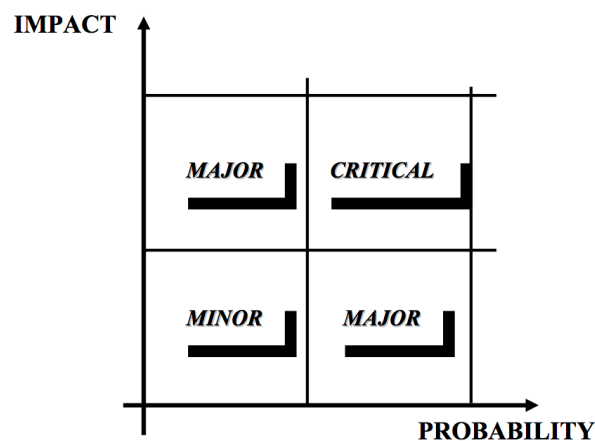
2.3. Risk management

There are risks in every phase of the process of procurement, during each stage there will be risks that have greater importance. To mitigate and assist the risks to go away it is important to understand the main categories of risks in the procurement process (Interagency Procurement Working Group, 2006).

Risk analysis is a stage where planning takes place to find the origin, probability, and the greatness of the risks. It aids to direct the attention to the risks that need the most attention and are the most likely to reduce risks. Risk analysis should be formed for each stage of the procurement process and updated continuously. Risk management will mitigate the severity of the risk by reducing the probability of it happening or lessen the consequences with planning, monitoring, and other actions. It is the procurement specialist's job to find and identify and analyze the risk factors that could happen during a project. In addition to this it is also important for them to choose the most suitable management response for each risk. They can choose to respond by ignoring, reduce, transfer, manage, and decide which party is most suitable to manage the risks that are identified (Interagency Procurement Working Group, 2006).

Unfortunately, it is impossible to avoid risks in the business world and the public sector. It is a normal thing in the work environment, and they can be managed to a certain point. Some ways to manage the risks are to either target specific risks in certain categories of procurement or check the quality of procurement that is being applied to the different activities. The figure below will show the risk analysis and management matrix. This is useful to use during the procurement planning because the different activities are put on a risk continuum (low to high), and an impact continuum (low to high) (Interagency Procurement Working Group, 2006).

Figure 3: Risk Analysis and Management Matrix



Source: (Interagency Procurement Working Group, 2006)

It is beneficial to use risk management because it will give the company more confidence of the right supply at the right time, it will help to control uncertainty, reduce the impact of the risk, it will improve decision making, the team will have stronger communication skills, the budget will be more likely to stay a budget, and the possibility of damage to the image of the company will be lowered. In addition to this it is also important to understand that not all risks will be mitigated completely or will the procurement specialist have the power to do something about it. The responsibility of the risk should be issued, and each party should be able to handle and manage the risk. If one tries to make the other party responsible for the risk, this will result in a disagreement, it will waste time and money and it will leave the risk in place even though it is the company's interest that it be managed (Interagency Procurement Working Group, 2006).

Identifying the sources of risks is also important. For example, there are external factors, the complexity of the project, the way the project was planned, the procurement process, fraud,

corruption, and unprofessional behavior. Under external factors we can mean political, economic and nature. Project complexity can mean objective difficulty in specification of requirements. This could be because the conditions are not known or the requirement could be subject to change due to political reasons, or other reasons. If the project planning is not done well than it can contribute to the negative outcomes that have been previously mentioned. The procurement process has many risks in each of its stages and with this many consequences (Interagency Procurement Working Group, 2006). These are to be managed by the procurement specialist. Fraud, corruption, and unprofessional behavior can show up at any company and be a risk for anyone, and just like this it can enter the procurement process and can lead to loss of resources, budget, and damage to the reputation of the company. The following can help reduce the risks: transparency, competition and separation of functions is the basis of mitigation of risks. The reason for this is because they ensure that fraudulent and corrupt behavior will not go unnoticed. Procurement specialists and those who are involved in the procurement process can also consider themselves “risk managers” since they must be aware of the potential risks that might arise at each stage in the procurement cycle in both planning and execution of their activities (Interagency Procurement Working Group, 2006).

2.4. Sustainable procurement

Sustainable procurement (SP) is a concept that is used in the public sector to describe the achievement of sustainability goals in the purchasing and supply process. The term “sustainable procurement” refers to the process of acquiring goods and services in the achievement of long-term sustainability goals through the social and environmental factors into the buying and supply process as well as technical considerations. However, sustainable procurement is not the same as e-procurement. Sustainable procurement’s main objective is to reduce environmental impacts and increase social impacts, e-procurement’s goal on the other hand is to achieve greater procurement quality and transparency (Walker & Brammer, 2012).

Socially conscious procurement practices have been implemented in recent years because of social issues. Among them is a plan to expand procurement opportunities for minority and women-owned businesses, veteran owned businesses, and businesses owned by economically marginalized people. However, due to political pressures, differences, and costs it is difficult for organizations to fully commit to sustainable procurement. For a long-term implementation of sustainable procurement, all four elements of sustainability, environmental, social, economic, and governance, must be included in strict procurement policies. It's critical to comprehend how buying

affects ecosystems, companies, and society in terms of greenhouse gas (GHG) emissions and environmental impacts. Positive social changes can be reached with good governance, honesty and transparency around these policies which have the social changes as an objective. Sustainable procurement policies have the potential to solve both climate change and social issues by permitting the use of sustainability measures to reduce the negative effects of environmental degradation and to create a more just, cleaner, safer, and healthier society (Alibašić, 2020).

Sustainable procurement policies are being implemented in the public sector of organizations around the world, but the practice and policy does vary across different countries according to an international survey of procurement professionals. The study looked at whether the public sector organizations that use e-procurement and communicate with suppliers are more connected in different aspects of sustainable procurement practices. The connection between sustainable procurement and e-procurement appears to be less established than the environmental aspects, indicating a much greater focus on green procurement practices across countries. (Walker & Brammer, 2012).

3. FINANCING A PROJECT

A major construction project often requires a huge amount of capital. This is usually provided by lenders/investors or loans from a bank. The eight common sources of construction are: commercial banks, savings and loan associations, mutual savings banks, mortgage banking companies, life insurance companies, real estate investment trusts, government agencies, and there are alternate sources. When an owner is looking for the right method of financing, and they come across the commercial banks this is the first place where they will start. Large construction products are not cheap, and this is advantageous for the bank because it will take the owner many years to pay the bank back. They will most likely have the funds to cover the project, but usually at a commercial bank the owner will have to put down a ten percent down payment to show that the business has enough financial liquidity to handle a project so big. (Builder Space, n.d.) When a lender is providing the required capital, they will want to be assured that the project will offer a return on their investment. The direct costs of a construction project can be broadly classified into two categories. The first one is the construction expenses that are paid to the general contractor for building the facility on site. These direct construction costs represent about 60 to 80 percent of the total costs in most construction projects (Hendrickson, 2008). The second category includes land acquisition costs, legal fees, architect/engineer fees, construction management fees, interest on construction loans, and the costs of retaining vacant space in the facility until it is leased. Prior to the start of construction, careful financial planning is needed. Contractor loans are typically provided by banks, savings and loan organizations that specialize in construction financing. Different forms of construction loans are available for various types of projects. For a commercial building and institutional building these loans are usually acquired from commercial banks. Initially banks in this situation are viewed as construction lenders in a three-party agreement between the contractor, owner, and the bank (Hendrickson, 2008). The loan will be paid to the contractor on a mutually agreed schedule when the contractor work has been completed and verified. What will happen usually is that there will be a payment request accompanied by a progress report (e-logbook) and it will be submitted each month by the contractor to the owner which leads to a draw request to the bank. The disbursement of the contractor will be made based on their performance. The bank is primarily concerned with the completion of the project on time

and within the budget. After the project is finished the bank is no longer concerned because the risk transfers to the owner (Hendrickson, 2008).

Construction is one of the most important and largest sectors in the economy. The size and range of capital in construction has an impact on the development of other sectors of the economy and the country's potential and national income. Additionally, the construction sector is accountable for a significant portion of investment activity, which shows the sector's increasing importance in overall economic growth (Gorshkov & Epifanov, 2016). The successful execution of an infrastructure project is only possible if the project funding is organized properly. The availability of investment capital for a project, which includes cash and other investments expressed in monetary terms (fixed and current assets, property rights and intangible assets, credits, loans and liens, land-use rights) and essential for the project's execution with the corresponding return of the investments and interest for their use, is referred to as project financing (Gorshkov & Epifanov, 2016). The method of providing financial resources for a project must be organized in a way that each phase of the project's execution requires cash resources to be protected. This means that it is critical to ensure that the project will be completed on time. Finance planning will help to minimize risks because, the balance between owned and borrowed funds must be found (Gorshkov & Epifanov, 2016).

The financing process of a project consists of many stages, but first it is important to find a target loan. This means the mobilization of funds from different sources owned and borrowed. The main aspect that is important is to make sure that the loan is affected by the cash income that will be generated by the project itself. The stages of a finance process of a project can be the following: a preliminary study, coordination and signing of documents on the deal, and granting the credit for the project (Gorshkov & Epifanov, 2016).

A preliminary study needs to be conducted in the form of a market analysis and evaluating the effectiveness of the project in question. With this a decision will be made based on the feasibility of the investments. The funding is normally given to a specially created project organization. In addition to this, for legal and tax questions or problems it is normal to use external consultants (Gorshkov & Epifanov, 2016).

Next step is to coordinate and sign the documents about the deal. Once the parties agree on the necessity of investments, they will choose a funding scheme for the investment-construction

project and they begin to establish and organize the protocol of intent. This includes information on the project members, the intended use of the loan, and the process for authorizing the loan, as well as the interest rate, timing, refund order, and the parties' rights and responsibilities, guarantees, insurance and hedging, and lastly a list of collateral offered by the borrower to meet the Bank's obligations. Signing the protocol of intent serves as the starting point for further discussion of the transaction. For example, credit agreements, bank account opening agreements, rights assignment agreements, and agreements with investors and creditors (Gorshkov & Epifanov, 2016).

The granting of a credit and the implementation of the project. Provision of credit facilities with the ability to track the project's execution. Since the risks are high, the Bank has the authority to request a constant financial expenditure report. This requirement is included with the documents about the deal. The financing of a construction project involves a handful of participants. The main participant however is the Bank. The bank is the party that will organize and control the process of captivating investment to the project (Gorshkov & Epifanov, 2016).

3.1. Methods of financing

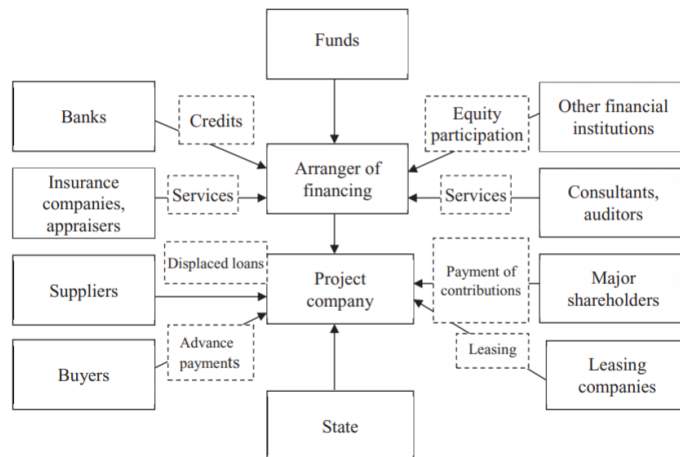
The Bank can act in many ways. It can act as an organizer of the project, a co-investor, or a financial advisor. In some cases, the Bank can be the main organizer of financing or it can be a member of a financial consortium. The Bank can use the following methods to organize the process of funding: lending, participation in capital (purchase of stocks and shares), purchase bonds, or guarantee provision and bails (Gorshkov & Epifanov, 2016).

While financing a project it is common to establish a project company that has the aim to attract resources, implement the project, and can pay back the investors and creditors. Establishing a project company involves separating the investment project from other activities in which the initiators are involved to avoid risks associated with the company's previous operations. This newly formed company has no financial background, which ensures that the borrower's credibility and credit history are not investigated. All project risks are shared among project participants and are governed by agreements and contracts (Gorshkov & Epifanov, 2016).

The figure below is a representation of participants who are investors of the project. The sponsors of the projects are major participants who are the organizers of the project company. The

projects initiators are those who submit a project loan application to the Bank (Gorshkov & Epifanov, 2016).

Figure 4: Participants of a Project



Source: (Gorshkov & Epifanov, 2016)

Financing a project is a high-risk activity, so it is very important to conduct an accurate financial evaluation. It is important to take commercial investment efficiency, financial sustainability, necessary financial resources and so on, into consideration. There are metrics for risk management that characterize the debt-to-debt service coverage ratios, as well as a project’s “safety margin”. Due to the high-risk factor, a greater share of the owned capital is required, this means that in the early stages of the project the ratio can be 70% to 30% or 80% to 20% (Gorshkov & Epifanov, 2016). Debt service cover interval and cumulative ratios. This gives the project company a possibility to perform its debt obligations. These are the ratios of cash flow of the project company to the amount of debt, and they should be between 1.2 and 2 (Gorshkov & Epifanov, 2016).

There are three main types of project financing, the decision will be made based on the level of the risk the lender takes. The following are the main 3 types: without recourse to the borrower, with limited recourse to the borrower, and with full recourse of the borrower. Without recourse to the borrower means that the lender takes all the risks that are related to the project. With this type of financing the borrower returns the loan with interest that is generated from the cash flow of the project. Even though this type of financing the riskiest and the most expensive type it is a “pure” kind of project financing (Gorshkov & Epifanov, 2016).

Limited recourse to the borrower is when the project risks are divided between the participants in a way where each one of them takes the risks that are theirs. This is the most common type of project finance and less risky. When there is a full recourse to the borrower, it means that the initiators of the project take full responsibility for the returning of the funds that were borrowed. This refers to conventional lending, as the Bank's involvement is limited to only providing funds under the protection of the project's initiators. Because of the high risks that are associated with this form of funding, the Bank must pay close attention to the project's implementation. Daily reports, debt repayment plans, and the project budget are critical reporting measures that will show deviations from expected indicators (Gorshkov & Epifanov, 2016).

In addition to these types of financing, there is also corporate state financing. Corporate financing assumes that there is an availability of owned funds that will organize financing. A public-private partnership (PPP) is a term used to describe mechanisms that include the State. This means that the State will attract private investment for co-financing implementation of socially important projects in this form of project finance (Gorshkov & Epifanov, 2016). Here are some advantages and disadvantages considering project financing is a way to attract funds that are borrowed. Some advantages include: the ability to draw investment capital while restricting owned funds, the distribution of project risks among the participants of the project, the lack of strict conditions for the borrower's financial position and enhancing reputation in business (this will happen if the realization of the project is successful). Some disadvantages can include costly document preparation for the request application to the bank for funding, a lengthy and complicated process of preparing documentation and the application time at the Bank, and this is linked to the project's assessment, need for completion, selection of participants and so on, the investors have strict control of the implementation of the project's investment, in addition to this there is a probability of loss of control if the Bank is given the opportunity to purchase the company's shares (Gorshkov & Epifanov, 2016).

The parties use developed methods of evaluating the economic and financial feasibility of the project, to reach a final decision on whether it is profitable to invest in the project or not. These approaches are often focused on a comparison of necessary costs and revenues. If the project will be compatible with the goals and interests of the participants, for example, if it delivers the best outcomes at the lowest cost, it will be deemed attractive and effective (Gorshkov & Epifanov, 2016).

4. THE PHASES OF BUILDING A NEW PROJECT

The first phase of construction is when a company decides to begin a project when there is a demand for it and there are also potential tenants. When a company undergoes a project, the process usually has 6 steps. The first one is concept design. It is the architect's job to plan and design the project that will be brought to life. First a conception space plan must be drawn up, this includes how much space will be needed starting from a seating plan, to restrooms, printing space, conference rooms, and so on. The next phase is when an interior architectural engineer is needed to work out the specifics. This includes limitations, technical requirements, heritage protection, safety rules, and correct process application. Limitations include the building height, gross built area, minimum green surface. Technical requirements include use performance such as light, air quality, stairs, room areas, parking spaces, the energy consumption is also a factor which needs to be taken into consideration, for example thermal insulation, energy consumption of the building/equipment's, and the production of the material that will be applied. Heritage protection is very important as well because the protection and management of tangible cultural heritage is regulated by legislation, Act LXIV of 2001 on the protection of cultural heritage (Europe, N.D.). Safety requirements include fire safety for example fire extinguishers, user safety for example health protection and quality of air, and work safety which includes safety equipment and preventative safety measurements. After all of this has happened, the company will ask 3 or more companies for a price offer for the following sectors: mechanical, electrical, fire protection, and structure. The architectural engineer meets with the supplier and then puts together a plan document about the construction. This document is looked over by both parties and is negotiated until it is acceptable for both sides. Approval is needed next, the mechanical, electrical, fire protection and structure plans need to be approved before construction. After the company has received approval for all the plans, construction begins. These plans are connected to the procurement plan, and the budget because once construction starts, it is up to the procurement specialists to know what to order, when to order it, and how much of it will be needed (Zsoldos, 2021)

When an architectural company designs and plans a project the next most important step is to receive permission from the capital and county government office. The procedure for this step has many requirements, for example what kind of documents are needed and in what form? What are

the types of permissions needed? And what kind of drawings are needed? Also, in this step the company needs to know which authority is responsible for certain measurements. For each part of the process the company must also know which institutes they have to go to. A few other parts of the process protocol are what are the durations of the process protocols, what are the taxes, fees, and dues for a project. These are all crucial because without this the company cannot start construction until all the needed permissions are granted. The government will need to see a plan on what the project will look like, and they must decide whether it will fit in in its surroundings, if it does not then the company has to change what the building will look like until permission is granted (Interview with Bicsérdy Gábor, 2021). Some examples are the 1997 LXXVIII. Act- on the build environment, 2001 LXIV. Act- On the protection of cultural heritage. Some governmental orders are national requirements of construction, shaping settlements, (253/1997) and there are governmental orders on the procedures and controls of the supervision and services of the construction authority. (Vidovszky, 2016)

The planning of construction is the next step. If all the permissions have been granted the company can start their project. For this step, the company either has their own architectural designers, or they hire a company. Most of the time a company will hire the person who designed the plans, to design the project. The planner works hand in hand with the company, they will usually have weekly meetings or workshops throughout the entire process. After the planning and designing is done, comes the construction stage. For this step, some companies hire a construction company, but some companies have their own construction department. A company will usually hire construction workers for the duration of the construction, and they will work alongside the site managers. The entire construction process is different for every company, but in this case, I will analyze the construction with a general approach loosely based on a Hungarian property developing company. A project will be started based on a budget and potential renter. Then a pre-plan will be made, the question “will there be a demand to develop” will be asked, and if yes then the construction will commence and tenders will be started (Bicsérdy, 2021)

After the company plans the construction, they need to find contractors. It is the procurement specialist’s job to search for contractors and know what is needed for their specific area. If more than one adequate candidate is found this is when a tender will be applied to see which company can provide the best services that will meet the company’s expectations (right time, right quality, right price). There are three types of tender methods in construction: open tendering, selective

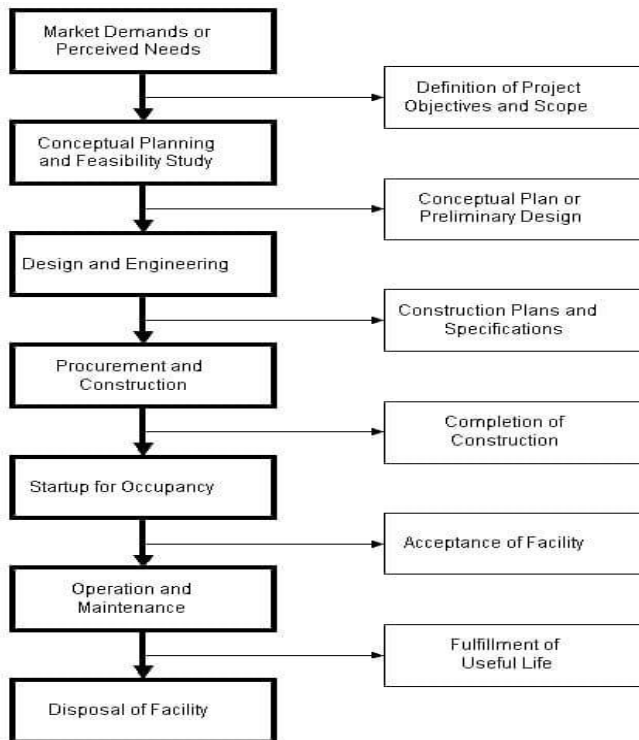
tendering, and negotiated tendering. Open tendering is when the employer advertises the project and allows as many contractors as possible who are interested to apply for the tender documents. This method may be a bit wasteful considering that preparing for tenders takes time and resources, and it is not guaranteed that the contractor will be chosen for the work. Selective tendering is when the employer advertises the project and invites potential contractors to be put on a selected list of contractors who will be invited to propose a price offer for the project. With this method contractors are asked to give a list of information about themselves which helps with pre-qualifying. This method has an advantage because the employer can select the contractors who have acceptable experience, are trustworthy, financially in a good place, and have the resources and skill set to do the work. Negotiating tendering is when the employer invites a contractor of his choice to submit a price offer. This is usually for a specific work that requires specific tools and equipment. The winner of the tender is usually based on compatibility and the method of tendering, the quality of their products and/or services as well as the price that they will deliver their services at. If there is no need for a tender, then the engineer/procurement specialist can start the negotiating and planning with the chosen company for the project (Mishra, 2014).

Finally, we have reached the stage of construction. To start the construction process, the supplier and the customer must be aware that there will be a logbook that will be compulsory to fill out daily (now called e-logbook). This data concerns basically every part of the built environment, from how businesses and individuals interact all the way to how the buildings consume energy. The details of the construction are recorded and analyzed to support decisions about construction and the process of real estate. These recordings are used for tracking of the construction process, performance improvements, the use of energy, business planning, internal and external reporting, assessments of risk, and financials. Since these recordings can assist in better designs, improve construction and the management of buildings, improving of market information, as well as enforce an effective policy. All this data and the transparent use of a logbooks will increase the data availability to a vast range of market players. In addition to this, it is also compulsory to lead a logbook for projects because, if they are not used the company commencing the construction can be fined very heavily. For example, if a supplier does not lead it for three days, then each deficiency will be charged seventy thousand forints per occasion, but the same goes for the company, if the site managers do not record to this logbook the company will be fined as well. Every company has different programs that they use, the decision about

which one is used is usually made in the company headquarters, and they will choose the one that best fits the company, but in the most part they are similar, and they have the same function. (Bicsérdy, 2021)

After both parties are aware of their obligations the construction process can start. If the area where the project will be, needs to be cleared and excavated then that is the first part of the construction. Sometimes the area will already be cleared, and the company will only have to dig for the shell and core of the project. After the area has been cleared and excavated, the foundation can be poured. Depending on the stability of the land the subsurface may need to be done before the foundation can be poured. Once the foundation has been poured and cured the shell of the project can begin. This can include installing wood frames or steel beams, it just depends on the size of the project, the preference, and mostly how the company received the permit. Doing rough electrical and plumbing is the next step (MHWilliams, 2018). A contractor will complete the rough electrical and plumbing work, this involves installing pipelines and wires. This is only the first part for the electrical and plumbing contractor because their work is continuous, so their job will be completed towards the end of the project. In unison with the electricians and plumbers the roofing contractors will come in to install and complete the roof on the project. This part will need to be done before any other work is done inside of the project because rain and outdoor elements can and will damage the work that will be done in the next steps. Around this time as well is when the exterior contractors will be called in to complete the façade, which will result in even more protection of the interior work that will be in the next step (MHWilliams, 2018). Once the project has the exterior walls and a roof, HVAC will come into the picture. HVAC is heating, ventilation and cooling. Vents, ductwork, heating, and cooling will be installed. While the HVAC is being completed so is the interior. This includes adding insulation, putting up drywall, suspended ceilings, and ceilings. An electrical contractor will come to the project at this point to finish installing outlets and lighting fixtures. Many of the fixtures can be installed after the interior walls have been finished. Toilets, cabinets, windows, doors, elevators, furniture, tables, and other items fall into this category. The final touches are applied at the end of the building process. This involves laying flooring, painting the walls, installing countertops, and installing bathroom faucets. Once all these works, and possible extra works have been finished is when the construction process and the project itself will be finished (MHWilliams, 2018).

Figure 5: Steps of Construction



Source: (SK, 2017)

The figure above shows the lifecycle of a standard construction project in a simplified version. However, these stages of development are not always strictly in this order. Iteration is needed for some points, while others can be completed at the same time or in overlapping time frames. This decision is primarily influenced by the project's design, scale, and urgency (SK, 2017).

Construction companies generate a huge amount of waste, due to their activities the construction industry plays a key role in keeping construction development sustainable this means that construction companies also have a key role in making sure the construction development stays sustainable. It should be kept in mind that construction companies are widely associated with intense carbon emissions. This could give the construction industry a chance to help with the reduction of carbon emissions. In addition to this it is becoming more and more popular for, not just construction, companies to incorporate recycling into their management. Finding new ways

and approaches to green construction and building operations is critical, and it is also important to ensure that all the economic interests of all the parties involved are met (Wang, et al., 2021).

Construction waste is made from components that are created either directly or indirectly from the construction process. Furthermore, demolition waste is the unusable materials that have been left over after a building has been demolished to create a new space for the project. These materials can include insulation, rebar, cables, bricks, asphalt, and wood. These materials can also contain asbestos*, lead and other hazardous substances. As a result, in the construction field, waste management and any solution aimed at mitigating the harmful effects of waste produced in construction needs to be considered (Franklin Associates, 1998).

The solid waste management according to the source of predominant methods is identified by the solid waste industry. Waste materials are identified as municipal solid waste (MSW) and construction and demolition debris (C&D). MSW is usually discarded from homes or businesses and disposed of in municipally operated landfills or recycling facilities. C&D is produced and maintained in landfills for C&D landfills or in processing facilities (Franklin Associates, 1998).

In-house recycling is critical, not only for the growth of environmentally friendly investment and construction projects (sustainable construction) but also for the successful implementation of those projects. In this case recycling is viewed as a response by the construction industry to the challenges posed by socioeconomic and environmental change (Wang, et al., 2021).

The recycling of CDW also known as the construction and demolition waste, it can also be known as C&D debris (Franklin Associates, 1998). This has achieved a significant amount of success in the EU and US and shows their levels of waste processing exceeded 80%. CDW recycling involves many parties because a building has many complex interactions throughout its lifecycle. Most of the construction and demolition waste comes from private actors, but in the foreseeable future it might be that the recycling of these materials will be done by those suppliers and enterprises that have previously built and demolished the building (Wang, et al., 2021).

The most important factors that a construction company can take into consideration to minimize waste, is to reduce, reuse, and recycle. This is also called the 3R strategy. Recycling offers the following benefits that will minimize waste: reduced demand for “new” materials, a reduction of energy for transporting the waste of new materials, and the disposal of waste that would take up the space in landfills (Wang, et al., 2021).

Developing a system of standards to balance the growth of green construction waste management would result in major changes in the economic, social, environmental, and ethical realms. Today it is no longer acceptable to imitate the principles of technocentrism² creation. It is however possible to envision the modernization of the industry by implementing environmental standards, the demand for secondary raw materials by recycling, and the creation of a methodology for measuring production performance based on the principle of resource conservation with the processing of suitable tools as a part of the implementation of the “green building” (Wang, et al., 2021).

The construction industry plays a critical part in the global economy. Given the importance and diversity of environmental issues, many researchers have, and continue to, find solutions for the sectors recycling and sustainability issues (Wang, et al., 2021).

² Technocentrism is a value system that is centered on technology and its ability to control the environment (Wealth, 2018).

5.PRIMARY RESEARCH

For the final part of the study, my goal was to gather opinions and experiences about procurement, e-procurement, and sustainable procurement. Since my place of employment is at a real estate developing company, it was not that difficult to find people who could answer my questions. In addition to this, my position here is in the procurement team, so I did not have to go too far as I am surrounded by procurement specialists. There were five colleagues with whom I could have sat down with for an interview, but sadly three of the procurement specialists were not able to take part in the interview due to a huge workload. One of my colleagues was an interior procurement specialist and the country procurement leader. I sent my colleagues the interview questions, so they could prepare their answers if they wanted to do the interview one on one. It is quite clear that working in procurement is a field in which employees have many tasks to juggle, as for this reason I was not able to consult with the three colleagues I had in mind in person. However, the country procurement leader, Bicsérdy Gábor, was able to find the time to have the interview one on one. I found his answers to be highly pragmatic, therefore I believe that not being able to interview the other procurement specialists did not make my research any less representative.

Thanks to the research I have conducted, I have been able to get a better insight in the theoretical part of procurement. I have a much better knowledge of the processes, not just in the procurement department but in other departments as well. Each person I interviewed received eighteen to nineteen questions³, which were about procurement, traditional procurement types, e-procurement, sustainable procurement, and some advantages and disadvantages of e-procurement.

Bicsérdy Gábor is a country procurement leader and has been in this position since he started to work at this company. It is advantageous for him and this company that when he first started working in the procurement field, he started as a site manager and worked in this position for four years. For his next position he worked at a company where his job was to win projects. This is where he learned how to negotiate so well because in this position it was his main objective. He worked in this position for four years as well. His third position was the same as his second, but at a different company. And in his fourth position before he became a country procurement

³ The interview questions and answers can be found in Appendix 1.

leader, he worked as a senior quantity surveyor and project manager. This is also advantageous for the position he is in now because a quantity surveyor is a person who calculates how much materials will be needed for a project, and how much they will cost.

Szarvas Léna has been working for the company for a little bit more than a year, she recently graduated from BME university with an architectural studies major, so she is relatively new in this field, but her answers were quite insightful and useful. Even though she has not been working in this area for as long as Gábor has, she is quite a motivated and driven person. This aided her when she began working as a procurement specialist, since she was thrown into the deep end when she was hired. According to her, this was a crucial first step to the world of procurement.

5.1. Results

The interview results I received were similar in many ways, but the answers were also very different from each other which I found very interesting. As the first part of my findings, I will transcribe those answers that were similar, and for the second part I will transcribe those questions and answers that were different.

The results that were similar were questions about the position, requirements, challenges, advantages, and disadvantages. For the questions that were asking about the position I concluded that working in this field comes with a high amount of stress and a lot of tasks that one must pay attention to. Any time a person who is working in a field where it is important to pay attention to the costs, where you are risking amounts that are bigger than your own wealth, will always be highly stressful because that person must take full responsibility if they made a decision that turned out to be bad. They will either face the consequence of paying for the mistake that was made and try to minimize the result of the mistake, or it will result in a termination of employment. Another example for this, is that it is important to pay attention to every detail in a contract, because if there is an error it can lead to miscommunication, which can result in a waste of time, capital and it can ruin a company's reputation. Because of this, working in this field is very challenging. To work in this field an individual must have a major in either engineering, or architectural engineering. It is also important to have the knowledge of calculation in finances because a lot depends on it in construction. In addition to this, it is also advantageous to have a legal background, or at least some knowledge. Based on the answers I received about procurement and the types of it, it was straightforward that modern procurement methods are more advantageous than the traditional method to both interviewees as they stated that traditional procurement is rather difficult, time-

consuming, and complicated. Moreover, the advantages of e-procurement in their point of views outweighs the disadvantages that might occur when e-procurement is used in a construction company. Furthermore, based on their responses it is obvious that the following are significant aspects of positives to e-procurement: end results can be reached faster, materials and services can be procured at a more reasonable market price, communication is made easier with the help of e-procurement softwares, because each partner has a place to come to when questions arise or if a document has been misplaced, it takes only a few minutes to find it in the system. When I asked them how they think e-procurement could be improved and make it more user friendly they replied with, “make” it easier to use for the older generation who are still working. Also, it is more environmentally friendly to use such softwares as most of the contracts and annexes are recorded to the system. In addition to this, the flow of information, the processes and the workflows are faster. It is also easier to use modern types of procurement because in today’s world it is more trouble-free to implement modern procurement into a company than to use traditional procurement way, due to the complications that may arise. Sustainable procurement is something that every company should try to implement considering today’s situation with waste. Sadly, sustainable procurement is expensive to implement which is why it is not too popular yet. However, when I asked the question, about sustainable procurement, which procurement is better, sustainable or e-procurement, and which one the interviewees preferred, both of their responses were sustainable procurement. It is better for the environment, and the future of this world depends on sustainable processes, because there is so much pollution and if companies tried to become more sustainable it would help the environment, the air quality, improves the health of the community, and many other benefits. Moreover, in Gábor’s opinion sustainable procurement is what companies should strive for, to motivate every company to be more sustainable. Therefore, the company we are employed by has implemented LEED, WELL, and BREEAM construction certification programs that show a certain level of environmentally friendly design for the construction of a project. Going over into the disadvantages, which there were only a few disadvantages that they could mention, setting up the software is a long process, learning the way the software works is also somewhat time consuming and the fact that e-procurement is tied to the use of computers and internet.

Sadly, in Europe the use of e-procurement is behind in the use of e-procurement compared to USA for example. The reason for this is because high technology is not as developed as it is here than in America. In addition to this, the USA has a same system standard and same language.

It is easier to develop something when there are no external factors like language barrier, differences in culture, and work culture. In Europe it is harder to reconcile, because when trying to make a software more developed the language barriers and cultures make it more difficult. This can be overcome by learning more languages, or Europe collectively learning a language to make communication easier.

The last few questions I included in the interview were a bit personal. My goal was to get a better understanding of what kind of values they have as people working in procurement, and if the interviewees would ever consider working in a different position. As a person working in procurement, or in any position it is important to have values. Everyone has values, but some people have good values, and others have bad values. For example, loyalty to the company, to have a non-bureaucratic approach, to have transparency, integrity, and precision. Both interviewees said they would be open to trying a new position that is not procurement. Gábor said yes, he would, because he has been in the field for a long time, and it is very tiring mentally to lead negotiations, create strategies, calculate, and make decisions. If he ever decides to leave the procurement field, he said that he would like to work as a sustainable architect, or to work close to nature. Léna also said that she would try herself in a different position, because her major is architectural engineering, and she would like to pursue this field in the future. However, for the time being Léna mentioned that working in the position she is now is very educating and gives her experience that will be great in the future. Working in procurement has proven to be filled with excitement, new challenges, feeling proud and learning how the market works.

CONCLUSION

In a construction company the procurement basically works the same way as in any company. Procurement is essential in every organization starting from office supplies, toiletries, and materials, items, and services needed for the company. In the 21st century it is inevitable to use the internet and the services it offers. Thanks to our ever-evolving world there are so many tools that can be used for day-to-day life and in the workspace. There is something for everybody on the internet. Companies have implemented the use of online platforms to help their development, time management, simplify workflows, improve communication and efficiency. If there is no e-procurement, then the processes stop. The advantages of e-procurement outweigh the disadvantages because everything is done online. It would prove to be very difficult in my opinion, to not use e-procurement solutions. E-procurement improves efficiency, timelines, and saves capital.

E-procurement helps companies in so many ways, for example, processing BoQ's, starting e-tenders, approval processes, generating LoW's, data storage, transparency, and many other features that are highly beneficial for the company. Moreover, the disadvantages can be overcome with the right resources, research and listening to the feedback users have. There will always be a need for improvement, to keep the system fast, simple, and user friendly. However, this can also be a disadvantage because there is not a lot of time for improvement during the work week, and it can result in the system shutting down for a few hours or even a day which can lead to a pause in the procurement processes.

Considering the disadvantages, it is still more advantageous to use e-procurement solutions because it speeds up and simplifies the company's operations. Nonetheless, e-procurement solutions have shown companies promising results that have aided in their development. The use of e-procurement has improved the quality of procurement and the ins and output of a company. With all the information I have gathered during this research, I conclude that the use of e-procurement solutions is beneficial for the construction industry.

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APPENDICES

Appendix 1. Interview questions

Appendix 1.1.

The interview was held on May 18th of 2021 with Bicsérdy Gábor.

1. What does procurement mean in construction?
2. What kind of values do you have as someone working in procurement?
3. How challenging is it to work in procurement?
4. What feelings are associated with working in procurement?
5. Have you ever been in a position where you were not procuring for a construction company?
6. What requirements are there to become a procurement specialist?
7. Would you ever consider working in a position other than procurement? If yes, why?
8. What is your opinion about e-procurement?
9. What are some advantages of e-procurement?
10. What are some disadvantages?
11. What is your opinion about traditional procurement?
12. Do you prefer traditional or modern types of procurement?
13. Do you know what sustainable procurement is?
14. What is your opinion about sustainable procurement?
15. Which one do you support more, sustainable procurement or e-procurement?
16. Which one is better in your opinion?
17. Why do you think Europe is behind in the use of e-procurement compared to America?
18. What do you think could improve e-procurement?

Appendix 1.2.

The interview was held on May 19 of 2021 with Szarvas Léna

1. What does procurement mean in construction to you?
2. Have you ever been in a position where you were not procuring for a construction company?
3. What requirements are there to become a procurement specialist?
4. What are the hardships that come with working in this position, and working sphere?
5. What is your opinion about e-procurement?
6. What is your opinion about traditional procurement?
7. Do you know what sustainable procurement is?
8. What is your opinion about sustainable procurement?
9. Do you prefer traditional or modern types of procurement?
10. Which do you prefer more, sustainable procurement or e-procurement?
11. What are some advantages of e-procurement?

12. What are some disadvantages?
13. What do you think could improve e-procurement?
14. Why do you think that Europe is behind in the use of e-procurement?
15. What is the most challenging thing about working in procurement?
16. What lead you to choose this career path?
17. What feelings are associated with working in procurement (for example, seeing a project through)?
18. Would you ever consider a different position to work in other than procurement? If yes, why?
19. What kind of values do you have as construction procurement specialist?

Appendix 2. Answers to the interview questions

Appendix 2.1. Bicsérdy Gábor's answers

1. Procurement determines the project, the cost, and influences the type of procurement that is implemented.
2. In my opinion it is important to be loyal to your company, to be transparent, and to have a non-bureaucratic approach.
3. I can not really explain how challenging it is, but I can say that it is challenging every day in a different way. For example, there are new obstacles that arise every day that require a solution.
4. Every position that is associated with costs is very stressful. You are risking sums of money every day that is work more than your entire wealth. You are responsible for all the decisions. If a bad decision is made it can put your position in risk, and you must minimize the damage as much as possible. The outcome of the project is in my hands.
5. No, I have not been in a position where I was not procuring for a construction company.
6. Engineering major, a feel for marketing, and it is good to have a small legal background.
7. Yes, it is mentally tiring. I would not mind working as a sustainable architect or to work somewhere in the nature.
8. I think that it is impossible to escape personal communication, no matter how hard you try.
9. E-procurement has a faster result, and you have the ability to retain materials and services at a more reasonable price.
10. Setting up the software takes a bit of time, and learning it is also time consuming.
11. Traditional procurement is much drier, it does not have a life to it. For example, traditional procurement is mainly used for goods, you must constantly analyze the supply and demand. It is much more complicated but at the same time it is not that vulnerable.
12. I prefer modern types of procurement.
13. It is a life-cycle analysis. In construction you must analyze which product is better depending on the costs, also to help with this we have WELL, BREEAM, and LEED.
14. I think sustainable procurement should be practiced more, and companies should be more motivated to operate in a sustainable way.
15. I support sustainable procurement more.
16. It depends on the project and situation.
17. In America there are 50 states that have the same system standards, and in Europe there are more cultures and different languages, and it is harder to reconcile.

18. I think e-procurement could be improved by making the softwares more user friendly for the older generation who are still working.

Appendix 2.2. Szarvas Léna's answers

1. Procurement is important in the aspect of finance, in the finance department is not aligned then there will be no project, or the company could go bankrupt.
2. No.
3. Architectural major, or construction industry major.
4. It is important to pay attention to the finances and calculations, because a lot depends on it.
5. It is advantageous because it is much harder for documents to go missing, and it is a little bit more environmentally friendly.
6. It is much more difficult, harder to keep track of, and it is not ideal for a construction company.
7. Yes.
8. It is very useful, but the implementation is much harder, the company must analyze it if it is worth it in the long run.
9. Modern procurement types.
10. It depends on the situation, I prefer sustainable procurement, but e-procurement is more useful.
11. The flow of information is faster, the workflow is faster, and the processes are faster.
12. The fact that e-procurement is dependent of computers and internet.
13. To develop the software more, to make it more user friendly, and to make more efficient trainings on how to use the software.
14. The high technologies are underdeveloped.
15. You must always be present mentally because a lot depends on it. For example, if a contract has a mistake in it, it can lead to miscommunications between supplier and customer.
16. I have always been interested in economic processes in the construction industry, and I have a realist disposition.
17. I am proud to be part of a project that is significant.
18. Yes, because my major is an architect, and I would not mind trying working in an architectural field.
19. Maximalism, precision, and loyalty.

