

CHALLENGES OF THE CONSTRUCTION INDUSTRY OF TRANSITION COUNTRIES

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Abstract: Construction industry is often criticized around the world, especially in the so-called transition countries. The faults, which it is always accused of, originate from the nature of the projects. These weak points include corruption, cost overrun, inadequate quality, not paying the subcontractors, tax evasion etc. This paper attempts to shed a light on the fact that these phenomena are not new and specific to this area. They have always existed in the history of civilization. The authors can only hope that some time we can overcome these problems that have always darkened the construction industry.

Keywords: construction management, failed projects, history.

1. Introduction

Construction industry is a vital sector in the economy of the transition countries. It has a significant share of their GDP and employs hundreds of thousands of people continuously. The importance has been obvious for centuries, millennia. It is expected to be a major industrial branch as long as mankind has to protect themselves against the forces of nature, their food has to be produced in industrial volumes, they would like to travel great distances in a short amount of time and so on. We could list many more demands whose satisfaction requires the contribution of the construction industry and the existence of a built environment.

It is unique to the construction industry that the realization of the projects is happening in public and the ready building can be seen, used and evaluated – based on appearance and practicability – by all social strata. Everyone can form and spread their own opinions, even via the media, regardless of whether they are experts or laymen. Most of the time even professionals argue about whether the project is necessary at all, about the site, the necessary dimensions, functions, layout. The ready creation enjoys either recognition – which then of course concerns the architect as well – or public loathing. Quite often, the latter is not due to the architectural or engineering values or the lack thereof. They are rather owing to the function or the fact that the aim of the project was misguided or ill-defined, or that

the solution does not fit the project scope. These problems are not included in the responsibilities of the engineers. The extent of construction costs that is considered inordinate or the project duration that is perceived as endless can be subjects of disputes as well.

Owing to the fact that the circumstances of the realization of projects are unique and unrepeatable – this is a fundamental criterion of the project definition – these debates are usually academic in nature. The fact that construction projects are more difficult to monitor and control – as opposed to the planted industry – from the preparation to the handing over phase stems from the character of these projects. The situation gets tinged further by the fact that the end result can only be compared to an imagined “it-could-have-been-this-way” state, of which we can never tell whether it would have been disadvantageous in another aspect.

Due to the above-mentioned particularities, construction industry is almost always surrounded by suspicion that assumes corruption, lack of competence, bad quality, insufficient protection of the domestic labor pool, defrauding workers and subcontractors and inadequate preparation concerning the given project. These negative associations are indeed most typical of the construction industry of all the branches. Unfortunately, there is a little truth in these accusations. One of the objective reasons for that originates from the nature of the projects. In the light of this, it is not surprising that the governments of different eras try

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to control construction activity continuously and with more and more strict regulations. However, construction industry is so complicated and is embedded into the world to such a great extent that the laws introduced with good intentions can create new and bigger problems than the ones they have solved.

This paper will not attempt to solve the actual problems of the construction industry, or even to discuss them in depth. The knowledge of the authors is insufficient for comprehending and solving such complex matters. The aim is to show through some interesting examples, stories that these issues are not new, most of them existed hundreds, thousands of years ago. When the organization of the society and the development of construction technology have reached a certain level, the above-mentioned problems appeared and in a sense became constant companions of our lives. This statement certainly does not mean that we have to accept these issues and handle them as inalterable. It indicates that past attempts to solve these matters have to be analyzed and consequences have to be drawn from the successes and the failures in order for these questions to be answered now.

2. Public Procurement

The purpose of public procurement is the same now as it was in the past: to spend the public's money effectively. In case of the construction industry, it meant that if the realization of a construction project was financed from this source, the client chose the winner within the framework of tendering. The chosen contractor then signed a contract in which they undertook the construction of the given object meeting the given deadline and quality specifications in return for the contracted price. This never occurred without troubles. The quotation from Vitruvius 24BC book (Vitruvius, 1914) from the ancient times shows how they tried to protect the public's money in these cases.

"In the famous and important Greek city of Ephesus there is said to be an ancient ancestral law, the terms of which are severe, but its justice is not inequitable. When an architect accepts the charge of a public work, he has to promise what the cost of it will be. His estimate is handed to the magistrate, and his property is pledged as security until the work is done. When it is finished, if the outlay agrees with his statement, he is complimented by decrees and marks of honour. If no more than a fourth has to be added to his estimate, it is furnished by the treasury and no penalty is inflicted. But when more than one fourth has to be spent in addition on the work, the money required to finish it is taken from his property."

Later he writes that: *"This fault appears not only in the matter of buildings (i.e. financial problems of projects financed from public sources), but also in the shows given by magistrates, whether of gladiators in the forum or of plays on the stage. Here neither delay nor postponement is permissible, but the necessities*

of the case require that everything should be ready at a fixed time,..."

It is quite interesting that even back then the author could only reference an alleged case from the long past.

3. Corruption in the Construction Industry

The Panama Canal is one of the world's most important engineering works from the point of view of trade. By using this, ships can spare more than ten thousand kilometers when they go from the Eastern coast of America to the Western coast and back. After the handing over of the canal, the distance between New York and San Francisco decreased from more than 22.000 km to 9.600 km. In spite of all the advantages it has, the Panama Canal is infamous for the corruption that took place in the construction phase. It has become the very definition of swindling.

The construction of the canal began in 1880, following many years of preparation. In fact, the preparation itself ensured the future failure of the project. Ferdinand Lesseps, the site manager, estimated the costs to be 400 million dollars, but the construction company wanted to spend only 130 million. The reasons why Lesseps, who had been responsible for the construction of the Suez Canal as well, accepted the significantly smaller budget are unknown. Later, he contradicted his previous estimations by stating that he expected much lower costs (www.czbrats.com/Builders/FRCanal/failure.htm)

The construction took place under terrible circumstances. Yellow fever and malaria decimated the – mostly black – laborers. More than 20.000 died in the first few years. The plans were modified many times. The original idea of the sea level canal was scrapped because it proved to be too big a task to excavate a 100-m deep trench in that rocky soil. Due to the modification of plans, lack of professional workforce, the inhuman circumstances, the works were constantly delayed and soon the financial resources ran dry. The scandal started in 1888 when the construction, which was 40% completed, paused. The costs at the time added up to 240 million dollars in contrast to the approved 130 million dollars. (www.canalmuseum.com)

The bankruptcy of the French Panama Canal Company stirred up a great storm in France. The public prosecutor's office opened an inquiry into the whole project. More than a hundred deputies were found guilty of corruption. Even de Lesseps was called to account for receiving reports that had not shown the actual situation of the projects. He was sentenced to jail, but he did not have to serve his time after all (www.panacanal.com/eng/history/history/index.html).

After a few years, the project was overtaken by the Americans. From this time on, the construction took place at a steady pace. The canal was handed over in 1914, two years after the scheduled deadline.

4. Cost Overrun

The fact that in the construction industry the costs usually overrun the predetermined budget is widely known. According to an international survey, this phenomenon occurs in case of 85% of the projects in general. Since the products of the construction industry are all projects, which are unique and unrepeatable, this statement can be accepted to be true for the construction industry as well. There can be many reasons for overrunning costs: from the inadequate preparation through the modifications in the meantime to the obstacles that arise during the realization that could or could not have been foreseen. This problem alone can be analyzed through thousands of pages, if there is a solution at the end or if it just partly contributes to the decrease in cost overruns. But this is not this paper's subject.

In order to prove that this issue is as old as the construction industry itself and has practically existed since the money was invented, let's look at the quotation from Vitruvius 24BC below (Vitruvius, 1914).

"Would to God that this were also a law (i.e. for punishing, the architects in case the costs overrun the budget determined previously by them) of the Roman people, not merely for public, but also for private buildings. For the ignorant would no longer run riot with impunity, but men who are well qualified by an exact scientific training would unquestionably adopt the profession of architecture. Gentlemen would not be misled into limitless and prodigal expenditure, even to ejections from their estates, and the architects themselves could be forced, by fear of the penalty, to be more careful in calculating and stating the limit of expense, so that gentlemen would procure their buildings for that which they had expected, or by adding only a little more. It is true that men who can afford to devote four hundred thousand to a work may hold on, if they have to add another hundred thousand, from the pleasure which the hope of finishing it gives them; but if they are loaded with a fifty per cent increase, or with an even greater expense, they lose hope, sacrifice what they have already spent, and are compelled to leave off, broken in fortune and in spirit."

The phenomenon that the actual costs exceed the calculated costs is characteristic of every type of projects nowadays as well, the construction industry projects are no exceptions. The question is: What are the reasons for the overruns? In the quotation above, Vitruvius suggested that the architect was responsible for the extra costs because he had been careless and negligent when estimating the costs, or perhaps he had not considered the financial situation of the client. Other times, the master builders, the contractors were blamed for the escalated costs. These disputes cannot be solved definitely even now. The law that Vitruvius urged, which held the architect responsible for the problems, was introduced in one form or another. For example, in case the consequence was a loss of human life. However, the architects are rarely impeached for the mistakes in the design that include, for example, not taking

the financial situation of the client into account and held financially responsible. It should be added in defence of the architects that the charges do not allow for thorough preparation and elaborate investigation. Owing to this, in case of certain project types – for example, reconstructions and huge underground structures – cost overruns are inevitable because the price of an adequately detailed and accurate preparation can be so significant that they do not want to pay at this phase of the project.

5. Bad Quality

Quality problems have always been present and are always going to be until the contractors can no longer increase their profits by using bad-quality construction materials and ignoring the specifications of the chosen technology. Of course, there can be other reasons for inadequate quality, for example, rush. The contractor's interest in raising the profit by decreasing the costs has always been top priority. A couple of examples are listed below to demonstrate that these matters have existed even in the ancient times.

5.1. Code of Hammurabi, Babylon

Hammurabi, the Babylonian king, introduced his code carved in stone in the 18th century BC. Even among these ancient laws, we can find ones about the responsibilities of the builders and the serious consequences of malpractice.

"228. If a builder has built a house for man, and finished it, he shall pay him a fee of two shekels of silver, for each SAR built on.

229. If a builder has built a house for a man, and has not made his work sound, and the house he built has fallen, and caused the death of its owner, that builder shall be put to death.

230. If it is the owner's son that is killed, the builder's son shall be put to death.

231. If it is the slave of the owner that is killed, the builder shall give slave for slave to the owner of the house.

232. If he has caused the loss of goods, he shall render back whatever he has destroyed. Moreover, because he did not make sound the house he built, and it fell, at his own cost he shall rebuild the house that fell.

233. If a builder has built a house for a man, and has not keyed his work, and the wall has fallen, that builder shall make that wall firm at his own expense."

5.2. Amphitheatre in the city of Fidenae

The following tale is told in Ambrus Seidl's fine book (Seidl, 2004).

Publius Cornelius Tacitus (55-120AD) described this instance that happened during the times of Marcus Licinius and Lucius Calpurnius in his work, *Annales*. An amphitheatre was being built in Fidenae, not far from Rome. They were in a hurry because they wanted

to organize gladiator games as soon as possible. This caused some serious problems with the structure. For example, the foundation's load bearing capacity was not enough; the material the auditorium was made of was not satisfactory either. This led to the sad event that during the games the whole amphitheatre collapsed and 50.000 people died. This large-scale catastrophe was dealt with by the Roman Senate in great details. It made them introduce many regulations concerning the construction of huge establishments. For example, employing a geotechnical engineer to investigate the soil before the construction became mandatory.

5.3. St. Peter's Basilica in Rome

This story is also described in the interesting book of Ambrus Seidl (Seidl, 2004).

The most famous church of the Catholic world, the Basilica of St. Peter does not have a tower. In the beginning of the 17th century Carlo Maderna (1556-1629) was appointed to augment the basilica designed by Michelangelo. Maderna was not paying enough attention to the low load-bearing capacity of the soil. In addition, he also made a mistake when aligning the footing.

The foundation was ready when he realized his fault and tried to correct it by placing the walls on the edge of the foundation, where they should be according to the plans. They finished the construction without noticing the mistake. Four decades later, Pope Urban VIII (1623-1644) appointed his favourite architect, Bernini to build two towers on the façade of the basilica. Bernini did not trust the elaborateness of his predecessor, so he gradually loaded the walls, soon cracks began to show. Experts said that they could solve the problem by strengthening the foundation. Despite this fact, the parts that had been constructed so far were demolished and the towers have not been built since. While being cautious saved Rome from a disaster, Budapest was not so lucky. St. Stephen's Basilica (Fig. 1), one of the most famous buildings of Budapest, collapsed during the construction.

5.4. St. Stephen's Basilica in Budapest

According to the website of the city of Budapest (<http://budapestcity.org/03-muemlekek/05/Bazilika/index-hu.htm>), the significant mistakes that were made during the design and construction phases led to the collapse of the huge building January 22, 1868.



Fig. 1. St. Stephen's Basilica, Budapest.

The little church that stood at the place of the Basilica was destroyed in 1849 due to cannonading by the Austrians. Pest City Council appointed József Hild, the famous architect of the time, to build a more spacious and beautiful church than those that could be found in Pest. The construction started in 1851. Owing to the fact that donations from the citizens of Pest were needed for the building, it proceeded rather slowly. Some people contributed to the realization of the project with money, others provided construction materials, such as stone, mortar, timber. The constant lack of financial resources and the mostly inadequate materials influenced the quality to a great extent. After the death of Hild in the spring of 1867, Miklós Ybl took over the management of the construction. After thoroughly studying the plans, he aired his views many times. He believed that the structural engineering calculations were wrong but the city council thought that he was exaggerating the problem. However, cracks started to appear on the building. On 21st January 1868 Ybl decided that the construction site had to be evacuated and the neighbourhood closed. The last straw was a huge storm the next night. The enormous building collapsed the following afternoon. As a result, Ybl redesigned the basilica, and the construction resumed according to his plans. Exactly 23 years after this incident, Ybl died, and could not complete his work. The basilica was handed over in 1905; 54 years after its construction had begun.

6. Domestic Industry and the Insufficient Protection of the Workforce

Localists, those people who are committed to developing their own environments, frequently voice their view

on the topic mentioned in the title. They support the idea that local companies should have an advantage over “foreign” ones in case of projects – including constructions – that are financed from public sources. Their most important reason, which is accepted by their opponents as well, is that local contractors pay taxes to local authorities, spending their money locally, meaning that their profit will be beneficial for the city, region or country in the end. The opposing view believes that in order to optimize the costs, that contractor should be employed which undertakes the job for the lowest price. Today’s world is capital-driven. However, the different economic approaches are unable to agree on whether the latter, global view or the cleverly protectionist system leads to greater welfare in the end.

One thing is for sure: the problem is not new. Here is an example to prove this point.

In 1865, before the Austro-Hungarian Compromise was signed, Franz Joseph ordered the construction of a headquarters for the parliament. On 18th August 1865 the city council decided that the building had to be at the place of the Sándor garrison. (The address of this plot today is 8 Bródy Sándor Street (Fig. 2). Now the Italian Institute of Culture operates here.) Ybl was appointed to make the designs. He was told that his fee would be defined as a percentage of the construction costs and if he managed to spend less than the predetermined sum, he would get 10 percent of the savings as a premium.

The plans were ready by August 24, which shows how hard-working Ybl and his design firm were. Two days later the ruler approved the design and obliged Ybl to present the detailed budget in 48 hours. On 29th August the budget was approved as well. Ybl made the working drawings and the construction started September 11.



Fig. 2. The old parliament, Budapest (György Klösz, 1890s).

The task was undertaken by building master, József Diescher. The contracted project duration was 90 days, so the building had to be ready by December 9, 1865. Ybl and Diescher did their best to accelerate the rate of the construction. In certain periods they allegedly employed 800 people. The bouquet celebration, marking the finish of the masonry works, was held November 4, 1865.

The benches and the furnishing of the great council hall had to be done in a hurry as well. Pressed by time, Ybl decided to hire carpenters from Vienna instead of the less experienced Hungarian ones. As a result, on 9th October, in the evening, 30-40 carpenters held a demonstration in front of Ybl's apartment. They smashed the windows of his flat and office and serenaded him. Apart from this disturbing incident, the construction was eventless.

7. Retaining the Remuneration of Subcontractors

It is almost every day that we can hear news in different media that say that the contractor was not paid by the client or the subcontractor was not paid by the contractor. Thinking that this phenomenon is only characteristic of recent projects is a mistake.

According to Christian teachings, the sins that people can commit can be put into different categories. There are the so-called heinous sins, which incite God's punishment. These are the following:

- Intentional murder (Genesis 4,10), (blood of Abel)
- Homosexuality (Genesis 18,20; 19,13), (sin of Sodomites)
- Oppression of the nation (Exodus 3,7-10), (Egyptians)
- Oppression of widows and fatherless children (Exodus 22,20-22)

– Retaining the earning of laborers

- Book of Deuteronomy 24,14-15

¹⁴ "Thou shalt not oppress an hired servant that is poor and needy, whether he be of thy brethren, or of thy strangers that are in thy land within thy gates:

¹⁵ At his day thou shalt give him his hire, neither shall the sun go down upon it; for he is poor, and setteth his heart upon it: lest he cry against thee unto the LORD, and it be sin unto thee." (en.wikisource.org/wiki/Bible,_King_James,_Deuteronomy).

- James 5,4

⁴ "Behold, the hire of the labourers who have reaped down your fields, which is of you kept back by fraud, crieth: and the cries of them which have reaped are entered into the ears of the Lord of sabaoth." (en.wikisource.org/wiki/Bible_(King_James)/James).

Retaining the earnings of the laborers was so common in Moses' time, more than 3.000 years ago, that he even codified its condemnation. This clearly shows that this kind of behavior of the clients and contractors is not a new concept.

The builders of the St. Stephen's Basilica had to fight against constant financial problems. In 1862, the masons, stonemasons and sculptors made a complaint that they

could not continue with their tasks if they were not paid. (Budapest)

8. Conclusion

The past decades, centuries and millennia do not only provide us with bad experience. Our magnificent built environment proves that those examples that should be followed have always outnumbered the bad ones. When making this statement we accept the fact that every building could have realized for less money and with better quality. We cannot forget, however, that every construction industry project is unique and unrepeatable. It is impossible to make something right for the first time, and, of course, there is no way of correcting our mistakes as there would never be another project just like this one.

Finally, the authors would like to share one more thought with the readers, which can give reasons for some contemplation. The negative examples listed in this article: St. Peter's Basilica, St. Stephen's Basilica, Panama Canal are all part of our architectural heritage. When standing in front of these monumental structures, we rarely think about the perversions that occurred during the realization of these grandiose projects, we rather admire their majesty. The buildings usually serve their users for a much longer time than their construction lasted. They can add to or subtract from the picture that is formed about the surrounding society with their appearance and utility. This could be a potent argument favoring those architects who believe that not the client's ideas and capital should determine how the built environment is formed, the buildings are designed in the first place, because these structures should satisfy the builders, the users and the whole society for centuries. Society tries to grant this by certain systems of regulations but they do not necessarily succeed, creating a topic for another paper.

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