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Building Information Modelling (BIM) adoption in the Estonian construction industry

Ehitusinformatsiooni modelleerimise kasutusele võtmine Eesti ehitussektoris
EA 60 LT

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Resümee (Summary in Estonian)

Ehitusinformatsiooni modelleerimine (BIM) on hakanud üha enam Eesti ehitusprojektide läbirääkimistel esile kerkima. Seda on kasutatud tööde efektiivsuse tõstmiseks üle kogu maailma juba üle aastakümne ning kinnitab üha enam kanda ka meie ehitussektoris. Paljudel ei ole siiski veel BIM-ist selget arusaama ning ei soovi erinevatel põhjustel end sellega siduda. Kui Eesti ehitussektor soovib iganenud ning ebaefektiivsetest töömeetoditest edasi areneda, tuleb need põhjused välja selgitada ning nendega tegelema asuda.

Käesoleva diplomitöö eesmärk oli välja selgitada, milline on hetkel ehitussektori arusaam BIM-ist, kuidas hetkel BIM-i ehitusprojektides kaasatakse ning millised on olulisemad aspektid, mis takistavad selle sujuvamat arengut. Uurimustöö küsimus oli:

„Millised on hetke suundumused BIM-i kasutamisel Eesti ehitussektoris ning kuidas saab BIM-i juurutamist parendada?“

Uurimustöö küsimusele vastuse leidmiseks viisin läbi intervjuu 12 ehitusspetsialistiga: 4 ehituse tellijat, 4 ehituse peatöövõtu ettevõtetest ning 4 arhitektuuri/projekteerimise büroost. Intervjuudes osalejad olid kõik tuttavad BIM-i ja selle kasutamisega. Eesmärk oli viia läbi vestlus osapooltega, kes on juba BIM-i enda projektides kaasanud ning seega teavad selle häid ja halbu külgi. Intervjuu analüüsiks kasutati kvalitatiivset metoodikat.

Suurim kasu, mida intervjueeritavad BIM-is näevad, on selgus, mida see ehitusprojektidesse toob. See aitab projekti osapooltel mõista, mida teised teevad, aitab tuvastada projekteerimisvigu, tõstab projekti kvaliteeti ning võimaldab üleüldiselt paremat otsuste tegemist kogu projekti vältel. Lisaks sellele nägid ehituse tellijad otsest majanduslikku kasu, peatöövõtuettevõtted arengut projekti osapoolte koordineerimisel ning projekteerijad ning arhitektid olid võimelised tuvastama projekteerimisel tekkivaid konflikte selgemini ning kiiremini.

Ehitussektori teadmatust BIM-i kohta peeti hetkel üheks suurimaks probleemiks. Seda eriti ehituse tellija koha pealt, mis omakorda mõjutab seega ka kogu ülejäänud sektorit. Paljudel on BIM-i olemusest väga erinev arusaam, mis tekitab teema üle palju segadust

ning takistab selle kaasamist projektides. Lisaks teadlikkusele on Eestis probleem riigi poolt puuduliku BIM-i standardiseerimisega ning üheste soovituste ning reeglite puudumisega. Paljudel on BIM-i kohta juba tekkinud nõuded ning juhendid, kuid kõik need erinevad rohkemal või vähemal määral ning takistavad ühtsete mängureeglite paika panemist. Lisaks valmistas intervjueeritavatele ka muret ehitussektori üldine killustatus. Konkurents väikesel turul on väga tihe ning koostööle ei pöörata tähelepanu. Suuremad ehitusettevõtted on juba alustanud BIM-i kasutamist ehitusprojektides ning ei ole nõus tulevikus partnerlussuhtesse asuma selliste ettevõtetega, kes BIM-iga tuttavad ei ole. Kuna taolised suuremad ehitusettevõtted on aga need, kes üleüldist sektori käekäiku juhivad, peavad organisatsioonid, kes nendega koostööd teha soovivad, ka enda olemasoleva töökultuuri tõsiselt üle vaatama ning aru saama, kuidas BIM-i seal kõige efektiivsemalt rakendada saaks.

Kui keegi küsiks minu käest, mis on hetkel kõige suurem probleem BIM-i rakendamisega Eesti ehitussektoris, siis vastaksin, et see on sõltuvus teistest projekti osapooltest. Seda on küüniline küll öelda, kuid tänase sektori suutmatus projekti siseselt koos ühise eesmärgi nimel töötada on see, mis pärsib ka uue tehnoloogia ning innovatsiooni sisenemist sektorisse. Paljud probleemid, mis olid ka varem ehitusprojektides olemas, on aga BIM-i juurdumisega taas kõneainet saanud. Projekti algusfaasides avastamata jäänud projekteerimise vead, erinevate projekteerijate lahendite ristumised, ebakompetentne kommunikatsioon projekti meeskonnas, killustatud ehitussektor, tsentraliseeritud standardite puudumine, puuduv tähelepanu ehitise kogu elutsüklile, kulu põhine hankemeetod, integreeritud ehituslepingute puudumine, koostöö puudumine ning üleüldine innovatsiooni puudumine on kimbutanud sektorit juba pikalt, kuid on nüüd BIM-i arengule takistuseks ning vajavad seega tähelepanu.

Käesolev lõputöö käsitles ehituse osapooli, kes on võimelised BIM-i enda projektides rakendama ning on ka seda juba teinud. Täiendavat uuringut vajab see osa sektorist, kes ei ole veel BIM-i enda töömeetoditesse kaasanud, et saada aru, mis on nende peamised mured ning hoiak BIM-i suunal. Lisaks ei olnud intervjueeritavatel palju probleeme seoses intellektuaalse omandiga, kuid see võib saada aktuaalseks, juhul kui laiem osa sektorist ka BIM-i rakendama asub. Sel juhul oleks vaja ka täiendavat uurimust sellel teemal.

BIM on tulemas, kuid on vajalik, et seda võetakse vastu intelligentselt ning kõikide ehitussektori osapoolte poolt ühiselt. Selle uurimustöö lõpetuseks võiks mainida fraasi

„Teise silmas pindu näed, kuid oma silmas palki mitte,“ mis iseloomustab paljude ehitussektori osapoolte omadust alustada süüdistustega teiste suunas, ennem kui vigu enda tegemistes otsima asutakse. Meie ehitussektor peab muutuma rohkem integreerituks. BIM võib sellele küll kaasa aidata, kuid fundamentaalne usaldus projekti partnerite vahel peab olema enne seda juba paigas.

Conclusion

Building information modelling has started to emerge as one of the talking points at the beginning stages of construction projects in Estonia. It has been used to enhance work efficiency all over the world for over a decade and is now gaining more and more of a foothold among our construction professionals as well. Yet, many in the industry still do not have a clear understanding of BIM and are reluctant to get involved. If the construction sector wishes to evolve past outdated and ineffective work methods, the reasons for this reluctance need to be found out and dealt with.

This thesis was conducted to find out what the exact perception of BIM is in the Estonian construction sector and what are the key issues that are preventing its smooth transition into the industry. The research question for this thesis was:

"What are the current trends of BIM use in the Estonian construction sector and how can BIM implementation be improved in construction projects?"

In order to find the answer to this question, a qualitative research strategy was used to prepare for, conduct and analyse interviews with 12 construction professionals: 4 construction clients, 4 people from general contracting companies and 4 from architectural/designer bureaus. The participants chosen for this study were all, to different extents, familiar with BIM use and its potential. One might even state, that they are BIM enthusiasts. The reason for choosing these individuals was the wish to conduct a more open-ended dialogue with a small number of knowledgeable people, opposed to conducting a more strict set of interviews with a larger number of people. The interviews were analysed by creating nodes from the most significant thoughts of the interviewees and then compiling them into themes, summarising the nodes in to a wider topic.

The greatest benefit of BIM the interviewees see in today's Estonian construction sector is the transparency it brings to the project. It helps project members understand, what everyone else is doing, helps with the early identification of design errors, increases the quality of the project and enables overall better decision-making. In addition, the clients

mentioned the economic benefit, the contractors saw the coordination process improving and the designers were able to find conflicts in their design.

The research revealed quite a few challenges in BIM implementation as well:

Lack of knowledge of BIM

One of the bigger issues in the industry is the lack of knowledge of BIM. Many still do not have a clear idea of what BIM or hold false preconceptions about it. The clients especially do not have adequate knowledge of BIM and are not able to formulate their requirements, which in turn is something, that inhibits BIM implementation within the whole sector.

Lack of rules in place regarding BIM

There is a lack of standardisation from the government regarding BIM. The sector needs to have some structure to rely on and that is something that is lacking in the sector at the moment. The interviewees also mentioned that when a project does not have a clear set of requirements in place at its start this can negate the potential benefits BIM aims to achieve.

Segregated construction sector

For BIM to gain a further foothold within the sector, there needs to be collaboration to a deeper level, than there currently is. The industry is very divided, as the competition in the relatively small market is quite high. This does not leave room for self-improvement and general innovation. The organisations, who have already started to accompany BIM in their processes, are not willing to partner with the ones, who have not. As these organisations are largely the ones leading the direction of the construction industry, businesses need to start thinking about what are the areas in their organisational working culture, that need to be altered, when adopting BIM.

If someone asked me today, what the biggest issue with BIM is, the answer would be that doing BIM means being dependent on other people. This sounds cynical and counterintuitive, as there are not many elements in life, which do not have that requirement, yet for a tool that is supposed to fix communication within a construction project, it surely struggles with it. There might still be hope, as the first step in fixing any problem is recognizing there is one and as many of the construction specialists – including

all of the interview participants in this research – have found out, many flaws have now come to light, which were already present before the arrival of BIM, yet are now interrupting its smooth transition into the sector. Undetected design faults, clashes between designed systems, incompetent communication between members of the project team, segregated construction sector, lack of centralized standardisation, lack of focus on the whole life cycle of the building at the plan, design and construction stages, cost-based procurement, lack of integrated contracts, lack of overall collaboration and a general lack of innovation have all been bothering the industry for a very long time now, yet are now preventing successful BIM implementation and thus need to be addressed.

As this thesis covered the areas, which influenced the more BIM-able section of the industry and what their thoughts about the situation were, further research needs to be conducted among the Estonian construction industry players, who are reluctant to accompany BIM to find out their most prominent needs and issues. Surprisingly enough, there was not much talk about the legal and intellectual property issues by the interviewees. This was an area, which arose from the literature study as a very delicate, yet difficult to handle issue. As this could become a problem once more players within the industry start getting involved in the BIM-game, research on how BIM could influence information ownership and intellectual property rights would be needed as well.

BIM is coming, yet it is vital, that it be welcomed intelligently and by all project participants alike. There is an Estonian saying, that goes: “To see a splinter in someone else’s eye, but not a log in one’s own.” This is quite accurate, when talking about this research and how many seem to forget or even deny their own mistakes in project processes and workflow, yet are quick to jump to conclusions with regards to others. Our construction industry needs to become integrated. BIM can certainly facilitate this, yet the fundamental trust between partners has to come beforehand.