

Specialized Software Usage among the Quantity Surveyors in Sri Lanka

TV Edirisinghe¹# and KPSPK Bandara¹

¹ Department of Quantity Surveying, Faculty of Built Environment and Spatial Sciences, General Sir John Kotelawala Defence University, Sri Lanka

#tvvindiediri2517@gmail.com

Abstract: *In the construction sector, the role of the Quantity Surveyor (QS) is critical by the constant review of designs in our construction industry. Many software configurations have emerged in the market as a result of technological advancements that solve current challenges. The objectives of this study were identify the level of specialized software usage among the quantity surveyors, determine the barriers to adapting advanced QS-related software in QS practice, determine the benefits of specialized software usage and determine the strategies for overcoming the barriers to implementing advanced QS-related software. Data was obtained through ten interviews and fifty questionnaire responses to achieve the objectives. 70 questionnaires were distributed for data collection, and 50 responses were obtained, resulting in a response rate of 71.42 percent. The study found that MS Excel and Auto CAD are the most often used quantity surveying software in Sri Lanka. The main sub barriers were the installation cost of the software, lack of experience with the software, and the lack of senior and firm support. Major benefits identified were Faster, increased productivity and accuracy.*

Keywords: *QS-related software, Quantity Surveyors in Sri Lanka*

1. Introduction

The quantity surveyor's work is made more difficult by the constant review of designs in our construction industry. When the building projects get more complicated, the ongoing

desire for more accuracy in the Quantity Surveying industry presents a difficulty (Doyle and Hughes, 2000). The nature and scope of services given by quantity surveyors within and beyond the construction industry have changed significantly during the last decade (Smith, 2003).

Many software configurations have emerged in the market as a result of technological advancements that solve current challenges (Reddy, 2018). According to a cursory look at the websites of most QS software providers, the modules incorporated into each software focus on core QS functions (Cartlidge, 2006). Many commercially created modern software applications are aimed at assisting quantity surveyors in their work. While some QS companies have accepted the usage of some of the tools, it is well known that others have yet to do so (Okumbe and Verster, 2008).

These modern software settings serve to speed up the traditional procedure and also come with a number of other benefits, such as easy revisions (Reddy, 2018). The most significant impact on productivity comes from the usage of modern software. It makes quantity surveying activities more efficient. If the functions are completed on time, at a cheap cost, and efficiently, any country can benefit (Smith, 2003).

But the thing is, the construction sector has been slow to adapt to modern technologies (Olanrewaju *et al.*, 2020). Quantity Surveyors aren't really concerned about enhanced IT adoption (Usman and Said, 1986). Most of the quantity surveying firms see technology adoption as just a difficulty to apply to construction activities. Many quantity

surveyors rely on few of IT application skills (Mui *et al.*, 2002).

2. Literature Review

A. *Information Technology in Quantity Surveying Practice*

Currently, the use of information technology in construction, particularly in the field of quantity surveying, plays a significant role. Computers, networks, software, and even fax machines and telephones are all part of information technology. Its objective is to make information interchange and administration easier, and it has a lot of promise in the construction industry's information process. These new technologies will surely have a significant impact on how businesses function on a daily basis (Rivard, 2000). Therefore, the use of technology in the building business is gaining popularity around the world (Shen *et al.*, 2003).

B. *Benefits of Software Usage*

The use of software saves a significant amount of time because the new applications' measuring values are immediately written down, and even very intricate calculations may be completed in a few minutes. Furthermore, the measures can identify quickly and easily (Reddy, 2018). With the use of IT in traditional practice, the productivity of quantity surveyors rose (Li, Irani and Love, 2000). Increased productivity, lower operational costs, direct value extraction from files, and improved collaboration among QSs are all advantages of employing software (Agyekum, Ayarkwa and Acheampong, 2015). When compared to traditional methods, the use of specialist estimation software during takeoff delivers more accurate data (Faizul, 2012).

C. *Issues Arising When Using the Traditional Methods*

The majority of quantity surveyors nowadays use AutoCAD software to perform quantification work. Quantity surveyors capture measurements with AutoCAD, However, just the most basic tasks may be completed with it. The QSs needs to apply

quantities in manually to Excel. Therefore Excel takes a significant amount of time and effort. The main downside of this method is that modifications are difficult to make, and the quantity surveyor must redo the entire procedure. The quantity surveyor's work is made more difficult by the constant review of designs in our construction industry (Reddy, 2018).

When compared to using modern software, the traditional way of taking off takes longer. The BQ cannot be made until all of the measurements have been completed. This takes a long time; especially when the construction project is large and the shapes are uneven (Seeley, 1997).

D. *Factors to Adopt Software*

This hurdle makes it difficult for these businesses to take use of specialized estimation tools. There are also additional hidden costs associated with computers, such as the cost of antivirus software, software and hardware maintenance fees, and monthly or annual software subscription fees. The cost of investing in specialized software is excessively high, and the quantity surveying firm cannot be certain of a long-term return (Murtaza and Ashrafi, 2008).

Due to a lack of knowledge, information, and training, quantity surveying organizations find it difficult to deploy software. They are reluctant to use technology because of their lack of knowledge with modern IT applications. Many quantity surveyors still don't know how to use computers. Furthermore, workers do not participate in training sessions to increase their IT knowledge and skills. This circumstance arises owing to the expensive cost of training, as well as a lack of time and enthusiasm (Mui and Tat, 2008). The most of senior executives seem to be against software advancements. They tend to prefer the conventional method of AutoCAD quantity takeoff (Reddy, 2018).

3. Methodology

The primary data for this study was gathered using a simple random sample method and purposive sampling method with only quantity

surveyors in the Sri Lankan construction industry as respondents from various contracting firms and consulting firms. The secondary data for this study was gathered using a comprehensive literature survey to determine the barriers and benefits of the advanced QS-related software in QS practice.

Data was obtained through ten semi structured interviews and fifty questionnaire responses to achieve the objectives. 70 questionnaires were distributed for data collection, and 50 responses were obtained, resulting in a response rate of 71.42 percent.

Table 1: Sample and Population

Type of data collection	Population	Sample	Sampling Technique
Literature survey	Web articles, Online journals	30	Secondary data
Detailed Questionnaire	For the population various kind of Quantity Surveying professionals considered.	50 Quantity Surveying professionals have been selected to the sample	Simple Random Sampling Method
Semi Structured Interviews	Experienced Quantity Surveyors from Sri Lankan construction Industry.	10 Quantity Surveyors who have more than 5 year's experience	Purposive Sampling Method

4. Results

The data gathered from the questionnaire and the semi structured interview were used to assess the levels of software usage

among Sri Lankan quantity surveyors. The frequency table was implemented to accomplish the above objective

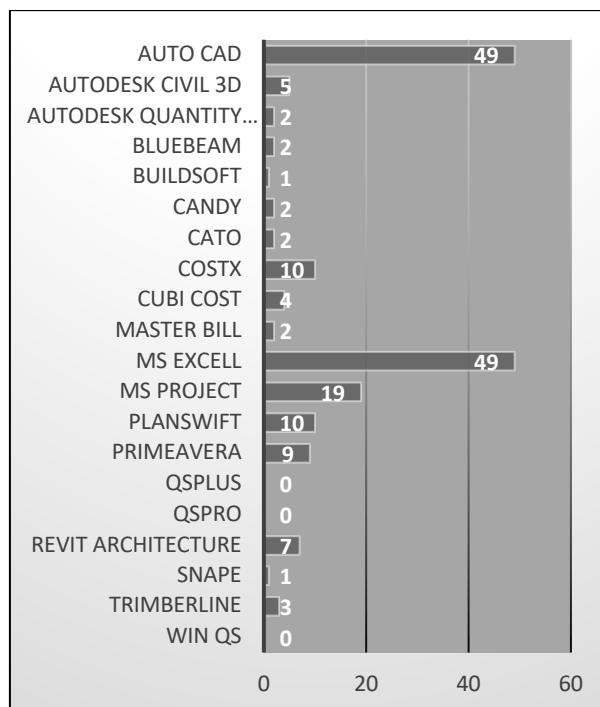


Figure 1: Usage of QS related software obtained through Questionnaire

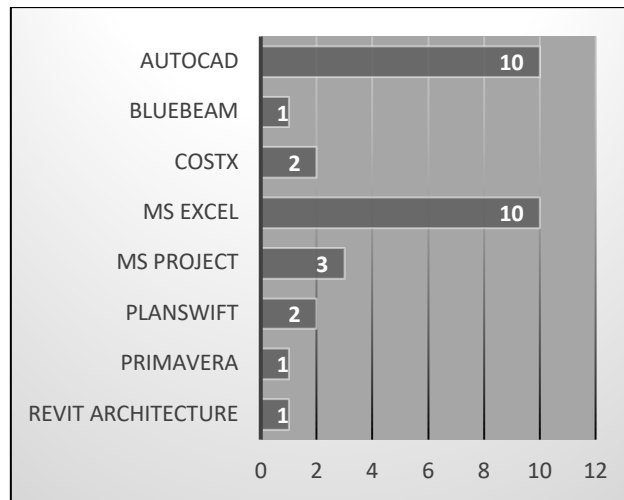


Figure 2: Usage of software obtained through conducting interview

Barriers of the software usage have been using a questionnaire and interviews, and it identified through the literature review has been analyzed using the Relative chapter. The information was obtained Important Index (RII) approach

Table 2: Ranking the sub factors of the readiness

No	Factor	Weighted total	Relative Index	Rank
1	Less senior and firms support	199	0.796	1
2	Security and accuracy fears	186	0.744	4
3	Backward mind set	190	0.760	3
4	Discomfort with new software	184	0.736	5
5	Scarcity of first-hand software experts	194	0.776	2

Table 3: Ranking the sub factors of the knowledge

No	Factor	Weighted total	Relative Index	Rank
1	Lack of understanding or training in software	215	0.860	2
2	Lack of Education Qualifications about QS software	214	0.856	3
3	Lack of experience with the software	216	0.864	1

Table 4: Ranking the sub factors of the Cost

No	Factor	Weighted total	Relative Index	Rank
1	Installation cost of the software	205	0.82	1
2	The maintenance cost of the software	200	0.80	2
3	The additional hidden cost of the software	195	0.78	3

The literature survey found the benefits of information was gathered via a software usage, which were then questionnaire and structured interviews. investigated using the RII approach. The

Table 5: Analysis of the benefits of the software

No	Factor	Weighted total	Relative Index	Rank
1	Faster	237	0.948	1
2	More accurate	234	0.936	3
3	Storage of data	223	0.892	7
4	Increased productivity	236	0.944	2
5	Professionalism	225	0.9	5
6	Reduced paper work	233	0.932	4
7	Lower operational cost	193	0.772	9
8	Minimal errors	224	0.896	6
9	Safe	213	0.852	8

The data gathered from the interview sessions was used to identify strategies for overcoming the barriers to implementing advanced QS-related software in practice. Interviewees highlighted some strategies, and the following frequency table was implemented to accomplish the objective.

Table 6: Analysis of the Strategies for overcoming the barriers to implementing advanced QS-related software

Strategies	Frequency	Percentage	Item
Seminars aimed at top management professionals to motivate them to utilize specialized software.	4	40%	A
Curricular integration of specialized software training at universities or colleges.	8	80%	B

Increased the supply of information on specialist software via social media by emphasizing the advantages.	3	30%	C
By conducting workshops, both quantity surveyor students and quantity surveyors improved basic computer literacy and software understanding.	6	60%	D
Encourage quantity surveyors to learn about software by watching videos on YouTube	7	70%	E
Provide low-interest loans to small construction and consultancy organizations for software purchase.	3	30%	F
Purchase software during the discount seasons.	2	20%	G
Use track software	1	10%	H

5. Discussion

According to the results of the questionnaire MS Excel and Auto CAD are the most commonly used quantity surveying software in Sri Lanka for their QS-related works. According to the interview data, MS Excel and Auto CAD were the most widely used softwares for quantity surveying practices by all the professionals. MS Project, Planswift, CostX, Primavera, and Revit Architecture software usage is less when compared with the usage of MS Excel and Auto CAD. According to the results, it is proven that quantity surveyors aren't really concerned about enhanced IT adoption.

The main sub barriers were identified according to the questionnaire were installation cost of the software, lack of experience with the software, and the lack of senior and firm support. According to the interview data, most of interviewees highlighted that high installation cost of the software, high maintenance cost of the software, less knowledgeable person for specialized software, lack of support from management, high training cost, afraid to adapt to the new software due to security accuracy fears, backward mind set and scarcity of first-hand software experts as

barriers. The cost of both software and hardware installation is extremely expensive. Most small businesses with limited financial resources consider these expenditures to be prohibitively high and would prefer to operate manually while looking for funding to invest in information technology (Mui and Tat, 2008). When comparing the results with the literature review, it is proven that factor again.

Major benefits identified through the questionnaire were faster, increased productivity and accuracy. According to the interview data, most of interviewees highlighted accuracy of the work, minimum errors, speedy, increased the productivity of whole project, improved efficiency, easiness, and transfer files easily, increased security and reduced paper works as benefits of the specialized software. It is proven that factors again through the literature review. When comparing the results with the literature review, it is proven that factor again. The use of software saves a significant amount of time because the new applications' measuring values are immediately written down, and even very intricate calculations may be completed in a few minutes. Furthermore,

the measures can identify quickly and easily (Reddy, 2018).

6. Conclusion

MS Excel and Auto CAD are the most often used quantity surveying software in Sri Lanka. CostX, Planswift and MS Project are the best software that can be used for a developing country like ours. According to the results, it is proven that quantity surveyors aren't really concerned about enhanced IT adoption.

The main sub barrier to the cost factor is the installation cost of the software. The main sub barrier for the knowledge factor is lack of experience with the software, and the main sub barrier for the readiness factor is lack of senior and firm support. Major benefit identified through the questionnaire is "Faster". Other benefits of the usage of specialized software are accuracy of the work, minimum errors, speed, and increased productivity of the whole project, improved efficiency, easy of transfer of files, increased security, and reduced paper work as the benefits. Curricular integration of specialized software training at universities or colleges was the best strategy for overcoming the identified barriers.

7. Recommendation

Recommendations provided for overcoming the barriers to implementing advanced QS-related software in QS practices. Management decisions are carried out by top management professionals of the QS firms. They are not concerned about the new technologies due to a lack of information regarding new software. Therefore, the seminars are aimed at top management professionals to motivate them to utilize specialized software by emphasizing its advantages.

Quantity surveyors are not concerned about the enhanced technologies due to lack of information regarding new software. Many QSs are reluctant to move from what they are used to new software. Most quantity surveyors think that the method they are

used to is the most accurate and easiest. Therefore should change their thinking patterns by supplying correct information. It is more beneficial if the supply of information on specialist software via social media is augmented by emphasizing the advantages of using it. Private institutes or software companies can increase the computer literacy of quantity surveyors. They will have a better understanding of how software works, what functions it serves, and in what contexts it can be employed. Quantity surveyors and student quantity surveyors can perform effectively in the construction industry if they have a thorough understanding of soft-wares. Seminars, lectures, workshops, and the addition of new modules to courses are some of the activities that public or private institutions can do to improve computer literacy and knowledge of software. And also, Despite the fact that there are a variety of universities and degree courses in Quantity Surveying, only a few institutions exist that provide software knowledge. Therefore, it is more beneficial to have curricular integration of specialized software training at universities or colleges.

You Tube is one of the simplest and most cost-free ways to learn. There are a lot of videos on YouTube about various software programs. Anyone who is interested in learning new software can learn it at any time.

Most small QS firms with limited financial resources believe that the new software's costs are prohibitively costly, and would rather operate manually while seeking funding to invest in information technology. If the government provide low-interest loan facilities to them through financial barrier can be overcome. Some software companies give discounts during some seasons. During the discount seasons, QS companies can purchase software at a lower cost than before.

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Authors Biography



Miss T.V. Edirisinghe is an undergraduate of General Sir John Kotelawala Defense University, following B.SC (Hons) Quantity Surveying degree. Her research interests include Contract Management, Sustainable Construction & Construction IT.



Mr. K.S.P.K. Bandara is a Lecturer (Probationary) attached to the Department of Quantity Surveying at General Sir John Kotelawala Defence University. He is a Chartered Quantity Surveyor. He completed his first degree in Quantity Surveying at University of Moratuwa. His research interests include Contract Management, Building Information Modeling, Sustainable Construction & Construction IT.