

# Factors Affecting the Timeliness of the Medical Equipment Procurement Process – A study at the Regional Directorate of Health Services (RDHS) in Gampaha, Sri Lanka

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**Abstract-** Procurement is recognized as a wider term than the mere purchasing of materials or services, based on specific requirements. Procedures and systems related to the procurement process does differ based on different countries, governments, sectors, organizations etc. but general consensus is that, the adopted process involves three (3) main stages identified as planning, purchasing and contract management. In the Sri Lankan health sector too, these key stages are prevalent in the procurement of medical equipment however, various concerns have arisen with regard to the timeliness of the current processes. Therefore, the objective of this study was to find out the factors affecting the timeliness of the medical equipment procurement process in the government health situations under the purview of the Regional Directorate of Health Services (RDHS) in Gampaha, Sri Lanka. This was a descriptive study done based on information gathered for the period of 2014/2015 related to the procurement activities of medical equipment at RDHS, Gampaha which, is the main health service provider for the second highest populated district in Sri Lanka. Two components were identified for the study and the first component was to obtain information of the procurement process from key stakeholders through self-administered questionnaire and informal interviews which, was more qualitative based. Second component was to scrutinize procurement records of medical equipment purchased in years 2014 and 2015, using structured fact sheets to gather necessary quantitative data. A total of 78 state sector health institutions are under the purview of RDHS, Gampaha and the officers at the Planning unit, Biomedical Engineering unit and Accounts branch are involved in buying the required medical equipment. Total study population was 65 and a heterogeneous sample of 28 individuals comprising of different categories of stakeholders were selected as respondents for the questionnaire to identify the qualitative aspect of the factors affecting the timeliness of the procurement process. Based on a total sample of 245 equipment categories a sample of 243 records were identified to obtain data of purchases done in 2014 and 2015. This study revealed that, several factors were affecting the orderliness and timely procurement of the requested medical equipment at three (3) key sub stages namely, (1) approvals; (2) equipment receiving and (3) technical evaluation of the process adopted by the officials at the RDHS in Gampaha. Some of the major influencing matters were, significantly a longer time period taken in the approval stage, unwarranted delays by the suppliers and also the issues relevant to the Technical Committee's evaluation process. Whilst conducting this study, the researcher did obtain the candid opinion of the respondents in improving the overall process and ten (10) suggestions have been made for consideration, based on the analysis of collected data as well. It can be concluded that, greater consensus among all stakeholders along with stringent government guidelines, would enhance the efficiency of the medical equipment procurement process in the state health sector institutions in Sri Lanka.

**Index Terms-** medical equipment, procurement process, timeliness, regional

## I. INTRODUCTION

The “building blocks” of the health system framework as described by the World Health Organization (WHO) consists of six elements<sup>(1)</sup> and one such key element is technology and logistic supply. In a more descriptive form, the definition of the word technology from a healthcare perspective, encompasses medical devices as well, apart from other relevant aspects. Furthermore, medical equipment which, is identified under the category of medical devices<sup>(1)</sup>, is an integral component in providing quality healthcare facilities for patients.

Substantial cost<sup>(2)</sup> is incurred in the procurement of medical equipment which, has a significant impact in the effectiveness and safety aspects of the healthcare services provided by health institutions. Timeliness is a key aspect in the purchasing process of critical

equipment in the health sector and it has been identified that, certain causative factors tend to prolong the lead time in receiving ordered goods. Some of these reasons include <sup>(3)</sup> issues in material requirement planning, delayed receipt of technical evaluation reports, lack of procurement skills, weak supplier relationship and late acknowledgment <sup>(4)</sup> of already prepared estimates. Considering the magnitude of goods, services and capital assets purchased by government institutions, it is imperative for such public procurement activities to be handled by, well trained <sup>(5)</sup> and competent persons. Moreover, the process should be administered by qualified and experienced procurement professionals <sup>(6)</sup> in order to avoid delays and maintain good procurement standards, sustain overall efficiency and effectiveness of the entire process.

The procurement processes in the health sector differs based on each country's government policies. Sri Lanka's public procurement system, is based on a set of comprehensive national procurement guidelines introduced in 2006 by the National Procurement Agency of the Ministry of Finance. Enacted by law, these guidelines and manuals are applicable to all public procurement processes happening at central, provincial, regional and agency level in all government as well as semi government organizations. In Sri Lanka the Biomedical Engineering division of the Ministry of Health is accountable for the procurement, maintenance and management of medical equipment required by most of the government hospitals while the Provincial Councils also get involved in this process <sup>(3)</sup>, when needed.

The procurement methods adopted in general by the provincial institutions are identified as national competitive bidding, limited national competitive bidding, shopping and repeat ordering <sup>(4)</sup>. There are key stakeholders and different committees which, get involved at provincial and regional level when procuring medical equipment. In this regard, the Procurement Committee (PC) should consist of a minimum number of three participants while different types of committees can be formed at departmental, ministerial and cabinet level based on the type of the government organization and permissible monetary limit. Additionally, the Technical Evaluation Committee (TEC) which, has been set up for the evaluation of goods and services and is jointly responsible <sup>(5)</sup> with the PC in facilitating the procurement process. The formal approval of a minimum of three committee members is needed, when evaluating purchases below the threshold of (Sri Lankan Rupees) LKR 10 million. Key activities of this committee pertaining to procurement of medical equipment include, stating the specifications, evaluation, shortlisting suitable tenders and certifying the accuracy of ordered goods upon receipt. Tenders under this process are awarded only to registered suppliers with the relevant procurement entity and an invitation, is extended to the prospective bidders (or suppliers) through a newspaper advertisement <sup>(3)</sup> published well in advance or by way of a formal invite.

The implementation of the Provincial Councils Act in 1989 devolved the state sector health services in Sri Lanka and accordingly the Regional Directorate of Health Services (RDHS) functions under the administrative purview of the Provincial Governor, Chief Secretary, Provincial Health Ministry and Provincial Director of Health Services <sup>(6)</sup> respectively.

The objective of this was to identify the factors affecting the timeliness of each stage of the procurement process of medical equipment at RDHS Gampaha.

## II. METHODOLOGY

This was a descriptive study done on health institutions, to identify the various factors affecting the timeliness of the procurement process of selected categories of medical equipment, in state sector hospitals in Sri Lanka.

Regional Directorate of Health Services Gampaha, located in the Western Province of Sri Lanka was selected as the study setting, for the period of 2014/2015. Recognised as the second highest populated district <sup>(7)</sup> in Sri Lanka with a population of 2.3 million, the RDHS Gampaha is considered as the main health service provider for the district and there is a massive demand for medical equipment by the preventive and curative health institutions in the district. There are seventy eight (78) state sector health institutions in the district of Gampaha <sup>(8)</sup> consisting of two (2) District General Hospitals (DHSs), three (3) Base Hospitals (BHs), eleven (11) Divisional Hospitals (DHs), forty six (46) Preliminary Care Units (PCUs) and sixteen (16) Medical Officers of Health (MOHs).

The Planning unit, Biomedical Engineering unit and Accounts branch at RDHS, Gampaha gets involved, in the procurement process of medical equipment as shown in Figure 1 and the relevant staff have been assigned specific job roles to ensure completion of the procedures. Further, the purchasing process of the required equipment is done over a period of two (2) consecutive years and it usually starts with the requests being made in the month of March, of the current year. With these requests being prioritized and incorporated in the annual plans, the funding method for procurement is decided and sent for approval to the relevant authorities. Involvement of the Biomedical Engineering unit in the tender process eases the identification of procurement needs and facilitates the needs of the TEC.

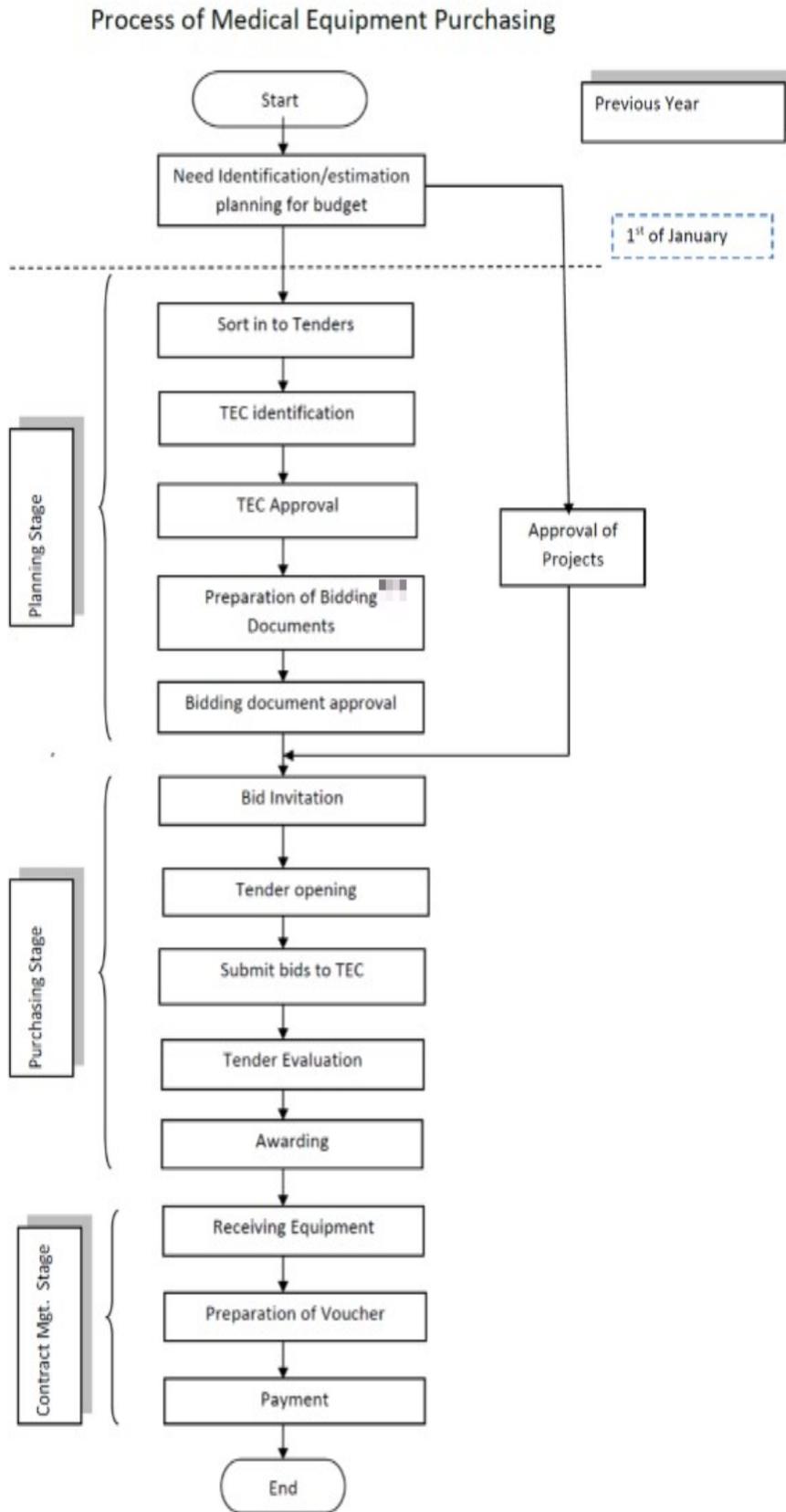


Figure 1:  Medical Equipment Procurement Process at RDHS Gampaha, Sri Lanka

This study was carried out over a period of nine (9) months starting from November 2015 while the data was collected during the period of April to June 2016. Furthermore, as an initial step retrospective gathering of secondary data was carried out based on available records. Ethical clearance was obtained from the Ethics Review Committee, Faculty of Medicine-University of Colombo. To comply with administrative requirements formal written permission was obtained from the Provincial Director of Health Services, Western Province and Regional Director of Health Services, Gampaha. The study population consisted of two components i.e. (1) stakeholders of the procurement process and (2) records of medical equipment procured in years 2014 and 2015.

For the element of stakeholders, a total sample of sixty-five (65) comprising of users (n=18), officials (n=24) and suppliers (n=23) was considered from the three (3) groups based on expert sampling method. A heterogeneous group of individuals were selected from the identified three (3) key groups and data was collected from twenty-eight (28) persons, resulting a 43% response rate. With a view of obtaining diverse views for a more objective statistical analysis, this sample comprised of various officials designated as Accountants (n=2), Assistant Director-Planning (n=3), Bio Medical Engineer (n=1), Consultant Community Physician (n=2), Development Officer (n=4), Junior Administration Grade Medical Officer (n=3), Medical Officer (n=5), Registered Medical Officer (n=1), Secretary (n=1), Senior Administration grade Medical Officer (n=2) and Supplier (n=4). Related to medical records, a total number of two hundred and forty-three (243) equipment categories were identified based on two hundred and forty-five (245) equipment types purchased in 2014 and 2015, providing a 99% realization rate in required gen. The secondary data was collected from the Planning unit, Accounts branch, Bio medical Engineering unit and Biomedical stores of the RDHS in Gampaha.

### **STUDY VARIABLES**

As the first component of this study, the stakeholders were categorized into three (3) different groups based on their involvement in the procurement process of medical equipment. As a result, the users, officers and other staff and suppliers were identified as the key categories. The medical records indicating details of medical equipment purchased by RDHS Gampaha using any type of funding source in 2014 and 2015, was the second factor considered for this study. From a more detailed perspective other variables included, selected categories of medical equipment, funding source, numbers of tenders and methods of purchasing.

### **STUDY INSTRUMENTS**

A self-administered questionnaire and semi structured interviews were adopted in order to obtain information from key stakeholders involved in the procurement process. The interviews assisted in obtaining more accurate information, related to the factors influencing the timeliness of each stage, in the purchasing process. Structured fact sheets were used to scrutinize the medical equipment procurement records of years 2014 and 2015 and quantitative data was collected.

### **MEASURES**

For operational definition purposes procurement year was considered as the “current year” and the previous year was not considered since the time frame remained same, with regard to identification of equipment purchasing and making annual plans. It should be noted that, this premise does not have any effect on the monitoring and evaluation phases of the procurement process for both years. Table 1 defines the three (3) main stages Planning, Purchasing and Contract Management, along with the sub stages and time period of operationalization relevant to the procurement procedure adopted by RDHS, Gampaha.

**Table 1: Identified stages of the procurement process of medical equipment and operationalization of time taken for each sub stage**

Stage	Operationalization	
	Date of commencement	Date of completion
<b>Planning stage</b> <i>(Defined as the time taken from 1<sup>st</sup> of January of the current year to the date of the bidding document approved by the Tender board)</i>		
Approval of project	1 <sup>st</sup> of January	Date of project approval
Sorting into tenders	1 <sup>st</sup> of January	Date of finalizing into tenders
TEC identification	Date of finalizing into tenders	Date of TEC nomination
TEC approval	Date of TEC nomination	Approval date of TEC by PDHS
Bidding document preparation	Approval date of TEC by PDHS	Date of completion of preparation of bidding documents
Bidding document approval	Date of completion of preparation of bidding documents	Tender board approval for document
Approval of project	1 <sup>st</sup> of January	Date of project approval
<b>Purchasing stage</b> <i>(Defined as the time taken from the date of bidding document approval to the date of awarding the contract to the supplier)</i>		
Bid invitation	Tender board approval for document	Calling for bids
Tender opening	Calling for bids	Opening of tenders
Submit bids to TEC	Opening of tenders	Receiving bids by TEC
Tender evaluation	Receiving bids	Finish evaluation
Awarding	Finish evaluation	Awarding the contract
Bid invitation	Tender board approval for document	Calling for bids
<b>Contract Management stage</b> <i>(Defined as the time taken from awarding the contract to the supplier to the date of receiving medical equipment)</i>		
Receiving equipment	Awarding the contract	Receipt of equipment
Preparation of voucher	Receipt of equipment	Preparation of voucher
Payment	Preparation of voucher	Payments
Receiving equipment	Awarding the contract	Receipt of equipment

Based on data collected through the questionnaire, the average of the time predicted by the experts (i.e. respondents) was considered as the “standard time” for that particular stage as illustrated in Table 2 and this was recognized as the assessment tool.

**Table 2: Predicted time in days for each stage of medical equipment procurement process by the respondents**

Sub stage	Number of responses	Percentage (%)	Average time predicted for the whole process (days)	Average time predicted from tendering stage (days)	Sub stage
<b>Identification at institutional level</b>	6	5.4%	32.17		
<b>TEC identification</b>	5	4.5%	10.60		
<b>TEC approval</b>	5	4.5%	8.40		
<b>Tender document preparations by TEC</b>	6	5.4%	11.33		<b>Planning stage</b>
<b>Approval of tender document by tender board</b>	6	5.4%	10.30		
<b>Identification at institutional level</b>	6	5.4%	32.17		<b>72.80</b>
<b>Tendering</b>	6	5.4%	8.17	8.17	
<b>Tender opening</b>	8	7.2%	21.00	21.00	<b>Purchasing stage</b>
<b>Average time is taken to sending the offers to TEC</b>	6	5.4%	5.50	5.50	
<b>TEC Evaluation</b>	7	6.3%	15.43	15.43	<b>60.67</b>
<b>Awarding</b>	7	6.3%	10.57	10.57	
<b>Receiving of equipment</b>	7	6.3%	48.00	48.00	<b>Contract Management stage</b>
<b>Preparation of vouchers</b>	6	5.4%	3.17	3.17	
<b>Payments</b>	6	5.4%	7.67	7.67	
<b>Total</b>	<b>111</b>	<b>100%</b>	<b>192.31</b>	<b>119.51</b>	<b>192.31</b>

Based on information given by the key informants, the average total time predicted excluding project approval date was 192.31 days and commencing from the tendering stage it was 119.51 days, as per the above analysis.

### III. RESULTS

Qualitative assessment of the interviews were done, based on the content method analysis using inductive approach. Information collected based on these interviews were manually coded and analyzed, in order to understand the key thematic areas of this study.

Further, data related to receipt of ordered medical equipment was statistically analyzed and presented in a tabulated manner. This study which was carried out among twenty eight (28) stakeholders included an equal number of fourteen (14) females and males as respondents, in the selected sample population. Analysis revealed that, majority of them were over forty (40) years of age and nearly 90% of the respondents had obtained higher education, beyond diploma level. Further, interviewed study population comprised of persons involved in the planning stage (n=9), suppliers (n=4), TEC (n=3) and Tender Board members (n=3) while more than 50% of this sample population had been involved in two or more stages, in the procurement process of medical equipment. Different views expressed by the respondents or interviewees were summarized as shown in Table 3, which provided feedback relevant to factors affecting the timeliness of the procurement process.

**Table 3: Summary of factors identified affecting the procurement process**

<b>Planning stage</b>	
<b>Late project approval</b>	Most of the projects are approve in the month of May.
	Allocation of money from unexpected funds in mid-term
<b>Problems of equipment prioritization</b>	Requests made to change the pre-determined medical equipment requirements (i.e. already identified in the previous year)
	Institutions not identifying the equipment needs early
<b>Appointing of TEC</b>	Refusal by consultants to be appointed to committee
	Being appointing to unknown fields
<b>Bidding document preparation</b>	Requesting high tech equipment
	Non-availability of a Bio Medical Engineer (BME)
	Unavailability of standard specifications
<b>Purchasing stage</b>	
<b>Technical evaluation</b>	TEC members not gathering for evaluation
	Non-availability of a Bio Medical Engineer (BME)
	Negative attitudes of TEC members
	Not being able to see the samples
	TEC members not gathering for evaluation

<b>Disputes and ethics</b>	Users not agreeing with the specifications
	Users requesting equipment of preferred brand names
	Inability of the TEC members to agree on matters through discussion
<b>Contract Management stage</b>	
<b>Delays made by suppliers</b>	Delay of failure to supply on the agreed dates
	Action not being taken against suppliers for violations
<b>Problems arising on receiving</b>	Unfitting infrastructure
	Suppliers or manufacturers delivering only part of the equipment

#### IV. DISCUSSION

This study revealed various factors which, have had an impact on the orderliness and timeliness of the procurement process of medical at the RDHS, Gampaha in years 2014 and 2015. Each sub stage of the process was studied, with a view of making detailed suggestions to improve the identified shortcomings of the current system. Views obtained from the experienced stakeholders involved in the procurement process, could also be used as documented guideline to improve the process further in the Western province. Gampaha district being heavily populated with a high number of health institutions, provided the appropriate background for this study which, provided an insight to the prevalent issues in the medical equipment purchasing process, in the government health sector. Results obtained from an effective representative sample of respondents, is considered to be useful for healthcare providers and administrators to plan operational intervention programs. Accordingly, this study, adopted a similar stance in minimizing biasness in the sample selection and collection of data as explained in the methodology. The findings of the qualitative study based on three (3) main stages supported the quantitative data analysis and a common, collective concern expressed by the key stakeholders was the delay in approving projects. A longer time being taken during the planning stages for project approval, was considered as highly unnecessary and also a setback, to move on to the next stages in the process. The Sri Lankan guidelines explain that, timeliness is maintained upon adhering to the procurement time schedule which, describes the sequence of each individual procurement action in relation to time<sup>(7)</sup> from the point of commencement, until its completion stage. It is the responsibility of the procurement entity i.e. RDHS, Gampaha to plan out the process in two (2) sub stages which, includes the first stage as need identification for tender documentation preparation and the second stage leading towards the awarding of the tender to the chosen supplier. Early identification of needs has been described as a positive factor<sup>(13)</sup> for the improvement of overall timeliness.

Though the guidelines does not indicate any standard times<sup>(7)</sup> for preparation of documentation, such documents should be prepared after discussing and obtaining consent from the TEC and Procurement Committee (PC). Hence, appointing of suitable officials to the TEC affects the planning stage in a significant way as revealed by the key informants. However, reluctance was expressed by experienced officers to be members of the TEC due to possible audit queries which, would arise based on the tenders approved. Nonetheless, they should not be afflicted by any fear or indistinctness, since the chosen method is expected to be impartial and transparent. Difficulties experienced in finalizing the bidding document as per equipment specifications has been highlighted as a factor, affecting the timeliness of the planning stage, when preparing the necessary documents. Many respondents identified the cause for this concern as the non-availability of a Bio Medical Engineer, to verify and approve the details of the requested high tech equipment based on standard specifications. Overall, the interviewees voiced their displeasure over the disorganized manner in which, the technical evaluation is conducted and the failure of the TEC to meet up and make quick decisions. Further, it was noted that, non

availability of pre prepared time schedules for TEC meetings, lack of commitment by the nominated consultants and disagreements among the members has added to the unnecessary delays, in the planning stages.

The contract management stage was afflicted with delays by the suppliers which, have been considered as “quite usual or normal” by the experts. The time taken to supply the ordered equipment does not seem to have got affected, by the date of awarding of the tender or contract but the respective supplier has taken the rest of the days from there onwards until 31<sup>st</sup> of December of the particular year, to supply the equipment. Lack of required infrastructure to install the equipment and deficiencies in the supplied items, were also identified as two factors affecting the procurement process, based on the feedback given by the respondents in the study group.

#### V. CONCLUSION

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#### VI. RECOMMENDATION

According to the findings of the study, following recommendations were made by the researcher to improve the timeliness of the procurement process of medical equipment at the RDHS, Gampaha which, ultimately could be considered for implementation at other government health institutions as well, based on similar identified concerns.

1. Early approval of projects
2. Calling tenders while waiting for project approval
3. Prepare proper guidelines and criteria for equipment prioritization
4. Appointing selected users of medical equipment as members to the TEC
5. Preparation of a meeting schedule for the TEC members at the commencement of the year
6. Identification of standard equipment used by health institutions
7. Coordination between units involved in the procurement process
8. Selecting suppliers with a credible and good performance background
9. Taking action against suppliers who frequently delay and fail to meet the deadlines
10. Recruitment of experienced Bio Medical Engineers to be employed at RDHS, Gampaha.

#### VII. ACKNOWLEDGMENT

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