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NATIONAL INSTITUTE OF FINANCIAL MANAGEMENT
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THEME OF मनुष्यवती भूमिरर्थः

Kautilya's Tantrayukti

अशीतिशततमं प्रकरणम्-तंत्रयुक्तय:

मनुष्याणां वृत्तिरर्थः, मनुष्यवती भूमिरित्यर्थः ।१। तस्या : पृथिव्या लाभपालनोपायः शास्त्रमर्थशास्त्रमिती ।२।

तदद्वात्रिंशद्युक्तिमुक्तम् – अधिकरणम् , विधानम्, योगः , पदार्थः, हेत्वर्थः , उद्देशः, निर्देशः, उपदेशः, अपदेशः, अतिदेशः, प्रदेशः, उपमानम्, अर्थापत्तिः, संशयः, प्रसङ्गः, विपर्ययः, वाक्यशेषः, अनुमतम्, व्याख्यानम्, निर्वचनम्, निदर्शनम्, अपवर्गः, स्वसंज्ञा, पूर्वपक्षः, उत्तरपक्षः एकान्तः, अनागतावेक्षणम्, अतिक्रान्तावेक्षणम्, नियोगः, विकल्पः, समुच्चयः, ऊह्यम् इति ।३।

यमर्थमधिकृत्योच्यते तदधिकरणम् ।४। 'पृथिव्या लामे पालने च यावन्त्यर्थशास्त्राणी पूर्वाचार्यैः प्रस्थापितानी प्रायस्तानि संहृत्यैकमिदमर्थशास्त्रम् कृतम्' (१.१.१) इति ।५।

–कौटिलीयेअर्थशास्त्रे तंत्रयुक्तिः - पङ्ग्चादशमधिकरणम्

English Translation

1. The source of the livelihood of men is wealth. In other words, the earth inhabited by men.
2. The science which is the means of the attainment and protection of that earth is the Science of Politics.
3. That contains thirty-two devices of treatment: topic, statement (of contents), employment (of sentences), meaning of words, reason for (establishing) something mentions, explanation, advice, reference, application, Indication, analogy implication, doubt (similar) situation, contrary (corollary), completion of a sentence, agreement. emphasizing, derivation (of a word), Illustration, exception, one's own technical term, the prima facie view, the correct view, Invariable rule, reference to a future statement, reference to a past statement, restriction, option, combination, and what is understood.
4. The object. with respect to which a statement is made, is the topic.
5. For instance: "This single (treatise on the) Science of Politics is composed mostly by bringing together (the teachings of) as many treatises on the Science of Politics as have been composed by the ancient teachers for the acquisition and protection of the earth."

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ABOUT AJNIFM

The Arun Jaitley National Institute of Financial Management (AJ-NIFM) is a Center of Excellence specializing in capacity building of professionals in the fields of Public Policy, Public Finance, Financial Markets, Financial Management, and other related areas for promoting the highest standards of professional competence and practice.

AJ-NIFM was set up in 1993 as a registered society under the Ministry of Finance, Government of India. To begin with, it was mandated to train the officers recruited by the Union Public Service Commission (UPSC) through the Civil Services Examination and allocated to the various services responsible for managing senior and top management positions dealing with accounts and finance in the Government of India. In due course of time, AJ-NIFM has become a premier resource center to meet the training needs of the Central Government for their senior and middle-level officers. AJ-NIFM also caters to the State Government, Defense establishments, Autonomous Bodies, and other Financial Institutions for their capacity building and research requirements.

AJ-NIFM plays a pivotal role in governance and administrative reforms by providing a platform for interaction, exchange of ideas, and experience among officers from various organized services, state governments, and personnel of civil and defense establishments.

Apart from capacity building, AJ-NIFM is also engaged in research studies in the areas of financial markets, accounting, audit, financial management, public procurement, and other issues related to public finance, public policy, and delivery systems. The outcomes of such research studies are published and disseminated through Research Papers, Journals, and Books.

AJNIFM also undertakes various consultancy projects relating to its domain viz., monitoring and evaluation of various government schemes, third party evaluations, writing of policy documents, manuals, etc.

The Union Finance Minister of the Government of India is the President of the AJ-NIFM Society. The Secretary (Expenditure) of, the Government of India is the Chairman of the Board of Governors (BoG). The Director, AJ-NIFM is responsible for the administration and academic programs of the Institute. AJ-NIFM has a distinct advantage of an amalgamation of faculty from academics, industry experts, and Government.

AJNIFM has five functional verticals:

- Capacity Building
- Award of Degrees / Diplomas
- Research & Publications
- Consultancies
- Innovation.

These functions are delivered by three Schools:

1. School of Public Finance (SPF)
2. School of Financial Markets (SFM)
3. School of Management Studies (SMS)

A. TRAINING PROGRAMMES AT AJNIFM

The approach of AJNIFM is to impart multifaceted training in various aspects of financial management, budgeting, accounting, auditing, public procurement, and information technology keeping in view the fast-changing economic, commercial and

technological environment. The focus is on practical applications, including the use of IT.

1. PROFESSIONAL TRAINING COURSE (PTC):

AJNIFM provides professional training to the Officer Trainees of organized Central Finance & Accounts Services which are responsible for the management of Finance, Accounts, Costing, and Audit functions in the Government of India. The duration of the Professional Training Course is 26 weeks, divided into two modules of 13 weeks each with a total of 36 credits.

From the year 2022, this program will be delivered in coordination with the Institute of Government Accounts & Finance (INGAF) and the National Academy of Defence Financial Management (NADFM) leading to the award of Post Graduate Diploma in Public Financial Management from AJ-NIFM.

2. MASTER OF BUSINESS ADMINISTRATION (FINANCE):

MBA (F) is a two-year full-time residential program. The program is recognized by Jawaharlal Nehru University, New Delhi. The program is open to fresh graduates as well as experienced candidates desirous of a career in the financial sector. The MBA (Finance) program has been designed to develop trained professionals in the financial sector capable of occupying positions of responsibility in regulatory bodies, market intermediaries, banks, mutual funds, asset management companies, stock exchanges, commodity exchanges, and similar organizations in private and government sectors. The curriculum also consists of attachments at Mumbai as well as Singapore wherein the participants avail an opportunity to interact with the professionals functioning at the apex level in the financial sectors such as RBI, SEBI, NCDEX, MCX, FIMMDA.

3. MASTER OF BUSINESS ADMINISTRATION (FINANCIAL MANAGEMENT):

MBA (FM) is a two-year full-time program. This program is also recognized by Jawaharlal Nehru University, Delhi. The program is open to the officers at middle and senior levels, working with central and state government including defense services, public sector undertakings, and autonomous organizations/ bodies as well as executives from the private sector. The program is designed to enable the senior officers/ executives of the government and corporate sector to meet contemporary challenges in Financial Management including Public Financial Management.

4. POST GRADUATE PROGRAMME (GOVERNMENT ACCOUNTING & INTERNAL AUDIT):

The Post Graduate Programme in Government Accounting & Internal Audit Programme is a one-year program designed to upgrade the technical skills of officers of the office of Controller General of Accounts and other organized accounting services of the various government departments in the areas of accounting, internal audit, information technology, general management, etc. and improve their soft skills.

5. CAPACITY BUILDING PROGRAMMES / MANAGEMENT DEVELOPMENT PROGRAMMES (MDPS):

AJ-NIFM conducts many capacities building short-duration Management Development Programmes (MDPs) / Executive Development Programmes (EDPs) in

various areas of public finance viz expenditure management, revenue management, debt management, budgeting, public financial administration, financial management, accounting, internal audit, procurement, GST, IT, HR, etc.

The officers of Indian Economic Service (IES), Indian Statistical Service (ISS), Indian Telecom Service (ITS), other central government services, state government services, PSUs, municipal corporations, autonomous institutes, and bodies participate in these MDPs/EDPs.

AJ-NIFM also conducts a few programs under the ITEC initiative of the Ministry of External Affairs with the participation of officials from many developing countries.

Besides, AJ-NIFM also organizes a few mid-career training programs (MCTPs) for officers of participating services with international attachments.

B. General Information

1. Campus

The Institute is located on a plot of land measuring over 40 acres on Pali Road, Faridabad, Haryana. The Institute building is beautifully landscaped, with a unique architectural design. Its sprawling lush green lawns, luxurious green cover around with perennial shrubs, flowers, and trees make the campus an ideal place for serious studies as well as recreation amid nature.

2. Accommodation

The Institute has two hostels namely Ganga and Yamuna, each having 182 & 96 rooms respectively. The officer trainees are accommodated in Yamuna Hostel.

3. AJ-NIFM Library

AJ-NIFM Library is committed to providing the widest possible access to information and this commitment is reflected in the range of services provided by it. Its website https://library.nifm.ac.in/ is linked to various online databases that are available from any device within the institute network. The library works tirelessly to fulfill its mission to address the interests and needs of the institute, students, and participating members by providing and maintaining access to a collection of materials and electronic resources that addresses the interest and needs of the institute/library members.

AJ-NIFM Library is fully automated and has a collection of over 37,500 books on Finance, Management, Economics, Public Policy, Financial Management, Accounting, Computer, Taxation, etc. In addition, the AJ-NIFM library has an invaluable collection of books on literature, fiction, etc., both in English and Hindi.

The library holds a rich collection of electronic resources which include different types of the full-text online database(s) related to Social and Management Science covering more than 5000 Journals/Periodicals and E-books on different subjects. AJ-NIFM library also subscribes to Company and Industrial Database, and Socio-economic database for their users. The library is also providing different types of services viz circulation, reading facilities, mail alert service, reference and information service, database search service, document delivery, interlibrary loan, photocopying, orientation programs, Online Public Access Catalogue (OPAC), Current Awareness Services (CAS), and Research Assistance Service.

AJ-NIFM Library is a member of DELNET (Developing Library Network). It provides access to more than 3.5 crore records comprising books, E-Journals, E-books, etc. to facilitate their users/researchers.

3.1 RESOURCES

3.1.1 PRINT

Print	Resources
Books	37741
Bound volume of periodicals	2747
Current subscribed journals	54
Non-book Materials	3248
Newspapers	23
Magazines	25

3.1.2 E-RESOURCES

E-Books	
McGraw Hill	https://www.expresslibrary.mheducation.com/bookshelf
Kopy Kitab	http://ajnifm.kopykitab.com
Pearson	http://elibrary.in.pearson.com/
Sage Publishing	https://etext.sagepub.in/etext
Full Text Database	
J-Gate Social & Mgt. Sc.	https://jgateplus.com
EBSCO: Business Source Elite	http://search.ebscohost.com
JSTOR	http://www.jstor.org/
EPW	https://www.epw.in/
Sage Journals (17 Journals)	https://journals.sagepub.com/
Statistical Database	
CMIE Prowess IQ (CMIE)	http://prowessiq.cmie.com/
Economic Outlook (CMIE)	https://economicoutlook.cmie.com/
IndiaStat (Single User)	www.indiastat.com
Bibliographical Database	
DELNET	http://164.100.247.26/
ISID Research Reference	http://103.82.220.134/Login
Library Website	
On-line Public Access Catalogue (OPAC)	https://library.nifm.ac.in/

3.1.3 LIBRARY TIMINGS:

Monday to Friday	09:00 am to 07:00 pm
Saturday	10.00 am to 02.00 pm
Sunday and Gazette Holidays	Closed

4. COMPUTER FACILITIES

4.1 IT INFRASTRUCTURE:

- **Computer Labs:** The institute has three *"State of the Art"* Computer Labs. The computer Lab-1 and Lab-2 have a seating capacity of 55 and 62 persons

respectively which are used for conducting online/hands-on classes for Long Term Courses, Management Development Programme, and other short duration programs. The third computer lab is a small computer lab with a seating capacity of 19 being used for research and practice purposes. All the labs have good quality Multimedia projectors for conducting practical classes. There is a heavy-duty network printer installed in each lab.

- **Server Room:** There is a dedicated Server Room wherein all the servers have been installed together on different shelves in a closed server rack and are managed through a KVM switch. To protect the network by filtering traffic and blocking outsiders from gaining unauthorized access to the user data, a Fortigate 300C firewall is mounted in an open rack which is further connected to all the manageable L3 & L2 network switches in the same rack. From these switches, the connectivity has been extended to all the buildings through the fiber cable.

- **Desktops and Printers:** There are a total of 247 personal computers available in the institute, out of which 136 desktops are installed in three computer labs. The newly renovated Computer Lab-1 has the latest Lenovo M910Z All-in-one desktops whereas Lab-2 and Lab-3 have Lenovo M93p desktops. All the faculty and other staff members of the institute are issued desktops for carrying out their office work.

  The institute has 59 laser printers available in IT inventory comprising multi-function (monochrome and color) printers, heavy-duty network, and normal-duty standalone printers. All the faculty members and some dept. have been issued multi-function printers.

- **Internet Connectivity:** We are connected to the National Knowledge Network (NKN), a state-of-the-art multi-gigabit pan-India network, meant for providing a unified high-speed network backbone for all knowledge-related institutions in the country. This has recently been enhanced to a bandwidth of 1Gbps. Additionally, the institute has another internet connectivity of 20 Mbps from M/s BSNL to meet the redundancy in internet services.

  The institute has a robust LAN infrastructure that brings all the buildings (Admin building, Ganga Bhawan Hostel, Yamuna Bhawan Hostel, Executive hostel, and the Residential Quarters) together through manageable switches which are further connected to NKN through the firewall to cater uninterrupted internet connectivity to the users. Internet connectivity has been made available in every room of Ganga and Yamuna Hostels through LAN.

- **Wi-Fi Connectivity:** In addition to the wired net connectivity, a few locations like Lecture Halls for Long Term Programs, Faculty Rooms, Library, and Yamuna Hostel (1st and 2nd Floor) are Wi-Fi enabled.

- **Software:** The institute has advanced statistical and analytical software like SPSS, and IDEA to strengthen its research and consultancy program. In addition to this, a yearly subscription for Cisco WebEx Meeting / Google Class Room Hosts has been procured for all the long-term courses and MDP programs for conducting online classes because of the pandemic outbreak.
  - Anti-Virus (QuickHeal Seqrite EPTS)

- IDEA V11 Audit Software
- Tableau Desktop Professional Software
- SPSS 25.0
- Tally.Net subscription ERP 9.0
- MS Office 2013
- JAWS for Windows talking
- Prowess (Server-based)
- Cisco WebEx hosts all the programs (Long Term and Short Term)

- **Computer Lab-1 (**55 users' capacity)

Lenovo M910Z All-in-one desktop	Intel Core i5-7500, 8GB RAM,3.4 GHz, 1 TB HDD, keyboard, USB Optical Mouse, 8X DVD-RW, Windows 10 prof.
Printer	HP 3015dn

- **Computer Lab-2** (62 users' capacity)

Lenovo M93p Desktop	Intel i5, 3.2 GHz with 6MB Cache, 4GB DDR3 RAM, 500GB HDD, 18.5" TFT Monitor,104 keys keyboard, USB Optical mouse,6 USB ports, audio ports, 8X DVD Drive, Network card, Windows 8 Pro with Media& Documentation
Printer	HP 3015dn

- **Computer Lab-3** (19 users' capacity)

Lenovo M93p Desktop	Intel i5, 3.2 GHz with 6MB Cache, 4GB DDR3 RAM, 500GB HDD, 18.5" TFT Monitor,104 keys keyboard, USB Optical mouse,6 USB ports, audio ports, 8X DVD Drive, Network card, Windows 8 Pro with Media & Documentation
Printer	HP P1606dn

The comprehensive information about the institute can be found on the institute's website at **https://www.nifm.ac.in**.

5. SPORTS FACILITIES

- **Indoor games** - The Institute has a fully functional Indoor Sports Complex which includes Billiards, Table Tennis, Squash, Badminton, and Other Recreational Facilities.

- **Gymnasium facility -** available in the sports complex which includes equipment like Treadmill, Cross Elliptical, Cycle, Twister, Four Station Gym Machine, Weights, Dumble, etc.

- **Outdoor games** - Courts for Tennis, Volley Ball, and Basket Ball Besides Cricket and Football Ground.

ABOUT JOURNAL

The NIFM Journal of Public Financial Management (NJPFM) is the first Bi-annual (January-June & July-December) peer-reviewed research journal published by the Arun Jaitley National Institute of Financial Management (an Institution of Ministry of Finance, Government of India), Faridabad to provide a platform to academicians, researchers, policymakers for their research work in the field of *Public Finance & Public Policy, Economics, Banking, Governance, Public Procurement, Finance, Accounting, and General Management.* NJPFM is expected to enjoy a high readership among a cross-section of the intelligentsia.

NJPFM is expected to enjoy the highest readership. The areas of interest include but are not limited to the topics *cited supra.* From the day of its inception, the followings are the status of publication:

Sl.No.	Volume	Issue No.	Date	Date of Publication
1	I	1	January – June 2009	16 January 2009
2	I	2	July – December 2009	07 July 2009
3	II	1	January – June 2010	07 January 2010
4	II	2	July – December 2010	07 July 2010
5	III	1	January – June 2011	07 January 2011
6	III	2	July – December 2011	07 July 2011
7	IV	1	January – June 2012	07 January 2012
8	IV	2	July – December 2012	07 July 2012
9	V	1	January – June 2013	07 January 2013
10	V	2	July – December 2013	Not Published
11	VI	1	January – June 2014	Not Published
12	VI	2	July – December 2014	Not Published
13	VII	1	January –June 2015	07 August 2015
14	VII	2	July – December 2015	Not Published
15	VIII	1	January – June 2016	Not Published
16	VIII	2	July – December 2016	Not Published
17	IX	1	January – June 2017	Not Published
18	IX	2	July – December 2017	Not Published
19	X	1	January – June 2018	Not Published
20	X	2	July – December 2018	Not Published
21	XI	1	January – June 2019	Not Published
22	XI	2	July – December 2019	Not Published
23	XII	1	January – June 2020	Not Published
24	XII	2	July – December 2020	Not Published
23	XIII	1	January – June 2021	Not Published
24	XIII	2	July – December 2021	Not Published

25	XIV	1	January – June 2022	07 April 2022
26	Special Issue on Public Procurement			15 November 2022
27	XIV	2	July – December 2022	29 December 2022
28	XV	1	January – June 2022	31 July 2023

It is also expected that the *NIFM Journal of Public Financial Management* would be an appropriate platform for the faculty of NIFM to express and share their relationship with the rest of the world and in bargain invite the academic resources to strengthen NIFM's status as a true *Centre of Excellence* in Public Financial Management.

The NJPFM vision is to be reviewed, abstracted and indexed by the Econ Lit, Journal of Economic Literature [JEL] (of American Economic Association), Mathematical Reviews (of MathSciNet), Newjour, JournalSeek, Getcited, EBSCO database, Thomson Gale Database, and Indian Economics Association.

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Editorial*

Contracting in various hues have been in vogue in India for more than a century. This editorial aims to bring out a detailed understanding of various types of risk in public procurement, more specifically in PPP and how various uncertainties and risks in contract influence correct choice of contract design.

Zou et al (2008, p. 135) has classified different contracts types on risk sharing between government and private sector (Figure 1).

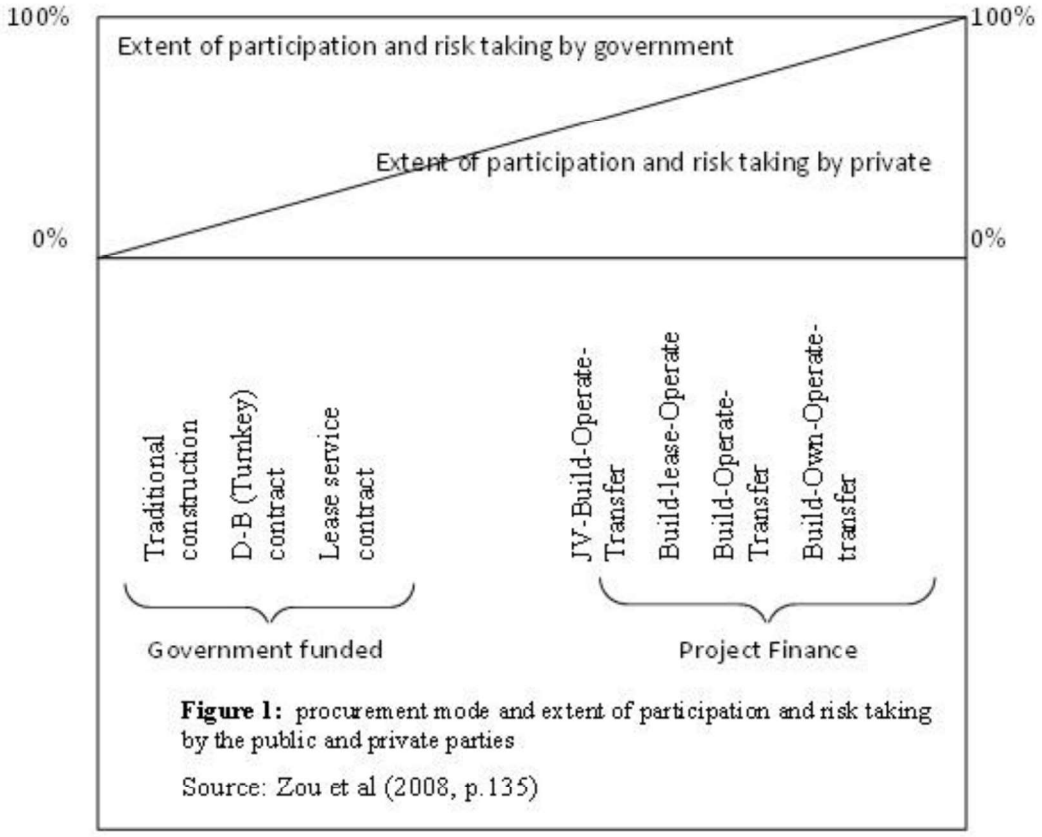

FIGURE – 1: Procurement mode and extent of participation and risk taking by the public and private parties
SOURCE: Zou et al (2008, p.135)

In the specific domain of PPP, equitable risk allocation has been considered critical for success of PPP (Mouraviev & Kakabadse 2012). However, risk management practices in PPP projects have been found to be highly variable, intuitive, subjective and unsophisticated (Ng and Loosemore, 2007). In a review of PPP in China, Adams et al (2006) have identified two types of risks

(i) systemic risk and (ii) specific risk

Systemic risks are labour costs, competitive pressure, GDP growth/decline,

* The theoretical discussion in this editorial is taken from Sahay (2018). His permission for the same is greatfully acknowledged.

inflation and other macroeconomic variables. The specific risks are specific to the PPP.

According to Adam et al (2006) the specific risks are typically the subject of tough negotiations between the public sector agency and the private companies involved in the PPP "process".

On the other hand, policy risk refers to the continuation and stability of PPP policy and also the different understanding of a given policy at the national and its implementation at the local level. With respect to private sector, Jin (2012) has brought out three components of a PPP partners' organizational commitment to risk management.

(i) PPP partner's general attitude to a risk,
(ii) PPP partner's own perceived ability to manage a risk, and
(iii) PPP partner's perceived reward for bearing a risk

Therefore, after a comprehensive review on risk allocation, Iossa and Matrimort (2009, p.43) have concluded

> .....the contractor should bear more demand risk (i.e. fluctuation in demand) in sectors such as transport, where users pay for the service and demand levels are affected by the contractor's effort. Contractors should bear less risk in sectors such as prisons, where users do not pay and usage is mainly determined by government's policy. Contract length should be higher in sectors where demand risk is lower, as in the water sector as opposed to the transport sector. Welfare under PPPs is higher when service quality is verifiable, demand risk is low or the firm can diversify risk, and when there are government contributions or the initial capital investment is low. Recourse to private finance can however result in improved incentives for the operator if lenders bring their expertise in monitoring the operator's effort. In this respect, PPPs might be suitable also for high capital value projects. Bundling of project phases and long-term contracting allow PPPs arrangements to provide efficient long-term incentives and to optimize the trade-off between investment and maintenance along the life of the project. This helps to prevent cost overruns but it requires institutions with strong commitment power. As the risk of regulatory opportunism increases, the case for PPPs is weaker' (Iossa and Matrimort 2009, p.43).

The above discussion shows that though public sector may be interested in transferring more and more risks to the private sector, it may not be an advisable strategy. Not only the private sector will charge a premium for such risk allocation, as the conclusion by Iossa and Matrimort (2009, p.43) shows, the private sector may not in fact be the right agency to bear certain types of risks. Traditional thinking in risk allocation in PPP is that risk should be transferred to that entity which is more capable of bearing that risk. However, this view has been contested by Jin (2012) who have argued that PPP partner's risk management *commitment* is equally important. They have pointed out

> A government agency, for example, may be willing to bear a risk because the perceived costs of transferring it to the private sector are too high. On the other hand, being unable to charge a sufficient premium due to market forces, a private partner may be less committed to a risk. In fact, many clients in the construction industry, who are uncommitted to take on a given risk, usually are averse to taking that risk, understand their inability to manage this risk, and thus perceive little reward (and even loss) for managing such risk. To further the discussion, without appropriate commitment from the private partner, it might be more efficient for the public partner to retain most or all of the given risk. If the private partner are forced to bear a given

risk, they may probably fail to efficiently manage that risk by charging higher premium, even with excellent 'risk management' capability.

(1) Relationship between risk and contracting

It is possible to choose a particular contract type depending on the risks. Turner (2001) classifies them as product risk and process risk. This is explained by the following example:

Say a housing colony is to be built in three phases. In the first phase, the cost components are:

Labour rate = Rs L_1/day, man days required in building a house = D_1, Material rate = Rs M_1 per unit, quantity of material required in making one house = N_1

Cost of one house = L_1x D_1 +M_1xN_1.If H_1 houses are to be built, then the cost of building the housing colony = H_1x(L_1x D_1 +M_1xN_1). Let us define this as construction cost C_1.

So, C_1= H_1x(L_1x D_1 +M_1xN_1), where H_1 is the number of houses to be built in the first phase.

At this stage, following are the construction options: each person of the housing colony can build her own house or if the persons cannot build the houses on their own (either because they do not know how to build a house or they do not have time to build the house or both are partly/fully true), then they engage an outside agent (called contractor) who builds the housing colony on their behalf. Since an external agent is being roped in, he will charge some money for the service which he will render as a contractor.

It is now assumed that the external agent (say Mohan) has the requisite knowledge to build the housing colony and he will exercise the same financial prudence as each house owner would have exercised. This would thus mean that the 'construction cost' of housing colony would not increase just because this external agent has been engaged. As the construction starts, convinced as they are of the capability and honesty of the contractor, members of the housing colony do not impose any restriction on the contractor either on material or labour deployed. This is an example of cost-plus contract. That is, the payment is based on 'cost' plus what the contractor takes as his service charge (which is his profit) (It is to be noted that even if the individuals would have built the houses on their own, they would have incurred the same cost as the contractor would incur because the contractor is 'honest'). In order that they are able to pay the contractor his actual cost, the members of the housing colony need to monitor H_1, L_1, D_1, M_1 and N_1. The conscientious contractor, on his part, uses his own best decision in selection of the four cost variables (L_1, D_1, M_1 and N_1). As they monitor, the housing colony members develop their own idea of what the labour and material rate should be. So let us say when the housing colony members start the construction of second phase of colony (wherein H_2 number of houses are to be built), they now impose a restriction. So L_2 and M_2 (labour days required in constructing a house and material rate required per unit of house constructed respectively for the second phase construction) are now fixed. So, the cost of construction becomes

C_2 = H_2x(L_2x D_2 +M_2xN_2), where L_2 and M_2 are now fixed, or
C_2 =f(H) x {f(D) +F(N)}.

At this stage, the housing colony members are required to monitor only H_2 (number of houses to be constructed in the second phase), D_2

and N_2. This is an example of a contract where the payment is on 'measurement-based schedule of rate' i.e. the housing colony members measure only H_2, D_2 and N_2 to make payment to the contractor based on the schedule of rates for 'L' and 'M'.

It should be clear here that now since only three parameters are to be monitored, the cost of monitoring the contract "where the payment is on measurement-based schedule of rate" will be lower than the cost of monitoring 'cost plus' contract wherein H_1, L_1, D_1, M_1 and N_1 are required to be monitored.

As H2, D2 and N2 are monitored, the housing colony members develop their own idea of how many labour-days are required to build a house and how much material is required to build a house. So, when the third phase of housing colony is to be constructed, the housing colony members now impose another restriction. D_3 and N_3 is now fixed. So the cost of construction becomes

$C_3 = H_3x(L_2xD_3+M_2xN_3)$, where D_3 and N_3 are now the fixed labour-days and material required to build a house and L_2 and M_2 (labour days required in constructing a house and material rate required per unit of house constructed respectively for the third phase construction) were anyway fixed in the second phase itself, or

$C_3 = f(H) \times constt.$

At this stage, the housing colony members are required to monitor only H_3. This is an example of a contract where the payment is on 'measurement-based schedule of quantity' i.e. the housing colony members measure only the quantity of houses built (H_3) and pay accordingly. It should be clear here that now since only one parameter is to be monitored, the cost of monitoring the contract "where the payment is on measurement-based schedule of quantity" will be lower than the cost of monitoring contract "where the payment is on measurement-based schedule of rate".

As H_3 is monitored, the housing colony members now develop their own idea of how much a colony of H_3 houses cost. So, they now impose a third restriction. They fix the price for the entire construction of construction of H_4 houses.

So, when the fourth phase of construction starts
Now C_4 = constt,

This is an example of fixed price contract. Since no monitoring is required, the cost of monitoring fixed price contract is the lowest.

It is to be noted that in all these cases, the contractor remains conscientious and also that the knowledge developed by the housing colony members is perfect. This means there will be no change in the value of cost parameters (L,D,M,N) whether fixed by the housing colony members or claimed by the contractor in cost plus contract. The housing colony members progressively move towards a fixed price contract only because they want to reduce their cost of administering or monitoring the contract by reducing the number of variables which they need to measure. Thus in ideal case, the cost of construction (C) will not change as we change the payment term from 'cost plus' to 'fixed price' contracts. What reduces is the cost of monitoring. What drives the housing colony members to shift to 'fixed price' contract is the lower monitoring cost of the contract.

There are other 'ideal' assumptions in the above discussion. They are:

(i) There is no uncertainty in the product of the contract i.e. the members of the housing colony do not change the specification of the house mid-way.

(ii) There is no uncertainty in the process of delivery i.e. the method of construction of

house, of getting the cement and steel etc does not change.

(iii) There is no uncertainty in the situation e.g. project does not come across a subsistence of earth while the 10th house is being built or the contractor finds that half of the land does not belong to the housing colony.

(iv) The cost of project is not influenced by the payment term.

Each uncertainty affects the cost of monitoring the contract differently.

Product uncertainty: In a fixed price contract, as the product uncertainty increases, it entails continuous monitoring of all the five parameters to reassess the variation incurred due to change in product characteristics. So, monitoring cost rises the fastest in fixed price contract. (In fact, almost the entire paraphernalia of government engineers in India do nothing but monitoring the various 'fixed price contract' entered into by them).

In a measurement-based contract, since fewer parameters are to be monitored, the rise in monitoring cost occurs but at a rate lower than that of 'fixed price'. In cost plus contract, since all five parameters are anyway measured, a change in product characteristics does not influence the monitoring cost at all as even with the changed parameters, the housing colony members are still required to monitor only these five parameters (which they were anyway doing). Hence the monitoring cost in a cost-plus contract is constant and independent of the uncertainty in product characteristics.

The above analysis is pictorially shown in Figure 2. For products with low uncertainty, fix price contract offers least cost of administering the contract. As product characteristics become more uncertain (i.e. after A in Figure 2), measurement contract offers least cost of administering the contract. The measurement can be based on 'schedule of rates' or 'bill of quantity'. For contracts with still higher level of product uncertainty (i.e. after B in Figure 2), cost-plus contract offers least cost of administering the contract.

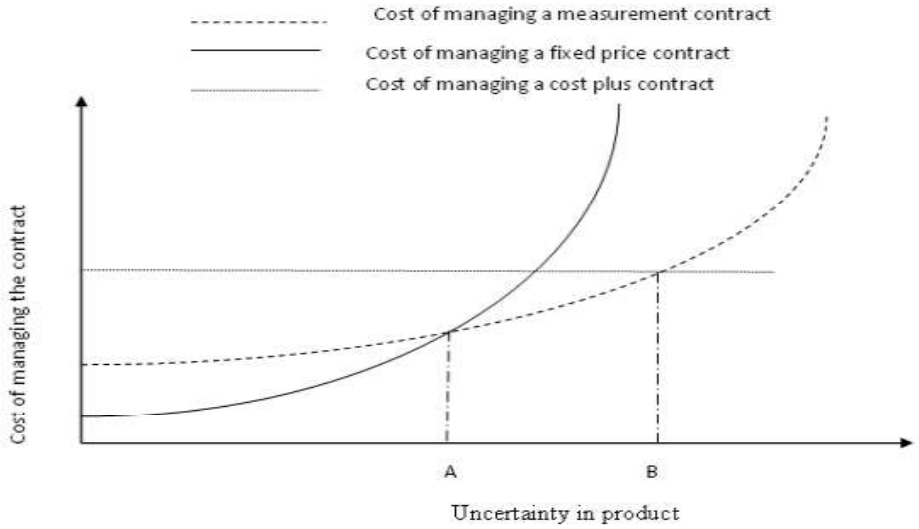

FIGURE 2: Cost of managing contract with different payment systems at different level of product uncertainty
SOURCE: Turner (2001)

Turner (2001) also brings out that goal alignment in a project is facilitated by aligning 3Ps: Purpose, Product and Process. The contractor profit comes from following a 'set' *process* to deliver the product. The purchaser profit comes from operating the *product* to achieve the 'set' *purpose*. The uncertainty in purpose is captured through 'complexity in situation'. If the purpose for which the project is being implemented is not going to change as the project progresses, it is a case of low level of situation complexity. But if the purpose of the project is likely to change during the project execution, it is a case of high level of situation complexity. In the example above, if the members of the housing colony decide that besides houses, they also want a recreation centre to be constructed, it is an example of change in the purpose of project and will be reflected as 'high complexity in situation'. Turner and Cochrane (1993) have developed a taxonomy of project type depending on uncertainty or goal and method (Figure 3).

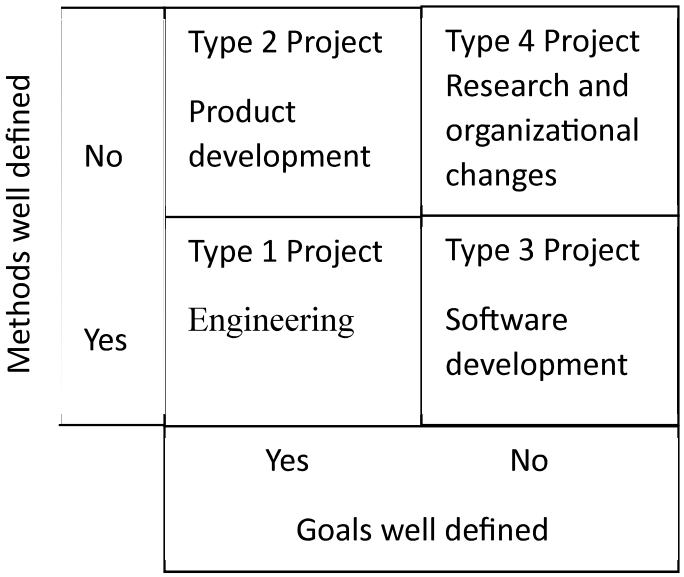

FIGURE3: Goals and methods matrix
SOURCE: Turner & Cochrane (1993)

Further, a project has three breakdown structures – the product-breakdown structure (*PBS*) (the bill of materials for the project), the organization-breakdown structure (*OBS*) (the range of skill types needed), and the work-breakdown structure (*WBS*) (the task matrix defining the involvement of each skill type in the delivery of each goal at a given level of breakdown). The OBS is usually well defined; so, the range of skill types is known. However, the PBS, or WBS, or both, may not be. Each project type needs different leadership skill and implementation technique. It is shown in Table 1.

TABLE – 1:
RELATIONSHIP BETWEEN PROJECT TYPE, LEADERSHIP FOCUS AND IMPLEMENTATION TECHNIQUE

Project type	Project characteristics	Leadership role	Implementation technique

Type 1	Goals and methods of achieving the project are well defined	The leadership role is that of a conductor, leading skilled resources in well-defined activities.	Activity planning, Configuration management not needed
Type 2	Goals are well defined but the methods are not	The leadership role is to pull together a multi-disciplinary group who are likely to have the breadth of knowledge required to define the project's methods. However, the leader is like a football coach: the goals are well defined, but the players are on their own during the game. The coach can improve the skills of competent personnel, and train them in set pieces, but cannot predict the course of the game.	Milestone planning – PBS elements, Configuration management of WBS (tasks)
Type 3	Goals are not well defined but the methods are well defined	The leadership role is in defining the purpose and objectives of the project, and converting those into the design of a facility which will deliver the required benefits. Once the purpose and objectives have been defined, the project is implemented as a Type-l project,	Milestone planning-life cycle stages, Configuration management of PBS specification
Type 4	Neither the goals nor the methods are well defined	The leadership role requires a mixture of inspiration and creativity to define the methods, and negotiation to define the goals.	Milestone planning-life cycle stages, the PBS elements Configuration management of PBS then WBS

SOURCE: Developed from Turner & Cocharne (1993)

Based on Turner and Cochrane (1993), for selection of correct contract type, Turner (2001) has developed a framework with different levels of product and process uncertainty. He also factors in additional factor like 'ability of the client to contribute' and 'complexity of the situation' in the framework. It is shown in Figure 4.

	Uncertainty of product		
	Lo	Hi	
Uncertainty of process Hi	Fixed price *Design and build*	Cost plus *Design and Build Alliance*	Hi Complexity of situation Lo
Uncertainty of process Lo	Measurement *Build only*	Not yet known	
	Lo Ability of the client to contribute	Hi	

FIGURE 4: Selection of contract types
SOURCE: Turner (2001)

Figure 4 shows that when the purpose, process and project are well defined, 'measurement-based build only' contract should be chosen. If both product and

process are uncertain, 'cost plus contract incorporating design and build component and alliance-based interaction structure between purchaser and contractor' are preferred. Here, the client and contractor work together to achieve the best outcome and share in any benefits that accrue. So, a PPP contract where product and process uncertainty are high, the complexity of situation is also high and the 'ability of the client to contribute' is also high a 'design and build alliance' cost plus type of contract may be more suitable. For projects with high level of process uncertainty, but low level of product uncertainty, 'fixed price design and build' contract may be desirable as then the contractor can take responsibility for finding the best way of delivering the project, and can make extra profits from finding innovative solutions (Turner 2001, p.7). Here 'what the contractor has to deliver is clearly defined, but they take responsibility for finding the best work method for delivering it, and make profit from managing risk' (Turner 2001, p.3).

(2) From the above theoretical discourse, this editorial now moves to specific papers which have been published in this issue. In their paper on GeM, Kumar and Asthana have compared the advantages of GeM based procurement as compared to traditional procurement. They have also analysed the challenges which GeM is yet to address like development of more user-friendly interface, development of a multi-lingual support and standardisation of product classifications.

In the second paper Mr Vinay Shandilya leverages his position as Chief Technical Examiner in Ministry of Defence and comes out with a set of representative guidelines to avoid vigilance investigation in a procurement case.

The third paper is on Smart Contract by Dr Brajesh Kumar. He has taken care to write it in a manner which makes the paper fully understandable to procurement professionals who may not be fully familiar with the technical aspects of smart contract. As succinctly brought by him, smart contracts can simplify the procurement process by enabling automatic execution of the procurement agreement when predefined conditions are met. In smart contracts, the terms and conditions are set in code, and there is no room for interpretation or misinterpretation. This helps to save time and reduce costs for all parties involved in a commercial agreement and also reduces potential contract related disputes as no party can repudiate its stand once coded in the smart contract.

In the fourth paper, Deepak, Reshma, Vennila and Sudha have made a comparison between two sustainability assessment tools namely the Global Reporting Initiative (GRI) and the Sustainability Accounting Standards Board (SASB). They have compared the commonalities and differences between GRI and SASB. GRI has made efforts to align its standards with other international reporting frameworks, such as the United Nations Sustainable Development Goals (SDGs) but the industry-specific materiality of SASB standards enhances its relevance for companies seeking to attract investment based on their sustainability.

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ARTICLES

Assessing the Efficiency and Effectiveness of Government E-Marketplace (GeM) in Transforming Public Procurement Practices Compared to Conventional Procurement Methodologies

PRANESH KUMAR* AND SMRITI ASTHANA†

ABSTRACT

Public procurement has evolved over the recent past from paper-based procurement to electronic procurement and further to a marketplace-based system. The Government e-Marketplace (GeM) is pivotal in promoting digital governance in India. GeM has been conceptualised with the aim of reforming public procurement in the country. The central government ministries and departments are mandated to undertake procurement through this portal only. This study aims to analyse the public procurement landscape in India, reflect the current trends in public procurement, and how GeM has led to a beneficial change in the Public Procurement domain. In this paper, the concepts of traditional procurement systems and GeM-based procurement systems are analysed theoretically from various dimensions like procurement cycle/ lead time, cost-effectiveness, etc. The causes for the preference for GeM-based procurement over traditional procurement are also presented based on an analysis of 100 sample cases. This paper contributes to a deeper understanding of the advancement in public procurement and the benefits of GeM in enhancing efficiency and effectiveness in public procurement and provide insights for policymakers and practitioners.

Keywords: Public Procurement, e-procurement, Government e-marketplace, Conventional Procurement

JEL Classification:

1. Introduction

Government procurement is an essential element of the Indian economy. It is not only for the smooth operations of governmental agencies and departments but is also utilised as a tool for promoting and sustaining economic growth and socioeconomic development (CUTS International, 2012). Existing statistics suggest that public procurement accounts, on average, for 15% of Gross Domestic Product (GDP) worldwide and is even higher in OECD countries, where that figure is estimated at approximately 20% of GDP. Departments like Defence, Railways and Telecom devote about 50% of their budget to procurement, which happens to be higher than the expenditure of most state governments (Malhotra, 2012). Since

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this involves public resources, it is vital to optimise procurement efficiency (Bhagat, 2017). Given the size of procurement budgets, the decision-making processes governing how to spend this money must ensure that the spending is for the public good if it is to inspire trust (Dawar, 2017). While governmental entities and public procurement professional associations have published numerous procurement reports and training texts, public procurement has been a neglected area of research interest by academicians (Thai, 2001). The advent of digital technologies has revolutionised various sectors, including public procurement. Government e-Marketplace (GeM) represents a significant step toward modernising procurement practices by introducing an online platform for government procurement. This research paper assesses the efficiency and effectiveness of GeM in transforming public procurement practices in comparison to traditional procurement methodologies. Through a comprehensive analysis of transactional data, stakeholder perspectives, and case studies, this paper aims to provide insights into the impact of GeM on procurement processes, transparency, and inclusivity.

2. Evolution of Public Procurement

The development of public procurement practices can be traced through different historical stages, each marked by distinct characteristics and drivers. In ancient societies, public procurement often relied on barter systems and patronage. Rulers or authorities would directly exchange goods, services, or labour with individuals or organisations. These practices lacked formal processes, transparency, and accountability. During the mercantilist era in the 16th to 18th centuries, governments recognised the need for regulating trade and procurement. Regulations aimed to protect domestic industries and foster economic development.

Formal procurement processes began to emerge, focusing on transparency and state interests. The Industrial Revolution in the 18th and 19th centuries led to significant changes in procurement. Governments were increasingly engaged in acquiring goods and services for infrastructure projects, military needs, and public services. Bureaucratic procedures and centralisation of procurement gradually became more structured. The World Wars of the 20th century marked a turning point in public procurement. Governments faced enormous demands for goods and services, leading to the development of standardised procurement practices, competitive bidding, and the creation of procurement agencies.

The mid-20th century saw the formalisation of procurement laws and regulations. Public procurement became subject to legal frameworks to ensure fairness, competition, and transparency. Many countries established procurement agencies or departments to oversee the process. In the Indian context, the apex statutory framework governing public procurement is Article 299 of the Constitution of India, which stipulates that contracts legally binding on the Government have to be executed in writing by officers specifically authorised to do so. The Constitution also enshrines Fundamental Rights (In particular, Article 19 (1) (g) – Right to carry on a Profession), which have implications for Public Procurement. (Ministry Of Finance, 2017). The late 20th and early 21st centuries witnessed the digital revolution, which transformed public procurement. E-procurement systems, such as Government e-Marketplace (GeM), emerged to streamline the procurement process. Online platforms, electronic auctions, and digital records significantly increased efficiency and transparency.
Looking ahead, emerging technologies such as artificial intelligence (AI), automation, and blockchain are poised to revolutionise public procurement. These innovations hold the potential to further enhance efficiency, reduce fraud, and improve supply chain management.

3. Legal Aspects Governing Public Procurement

A public procurement contract, besides being a commercial transaction, is also a legal transaction. There are a number of laws that may affect various commercial aspects of public procurement contracts. In the present public procurement domain, the following legal provisions are relevant (Ministry of Finance, 2017): -

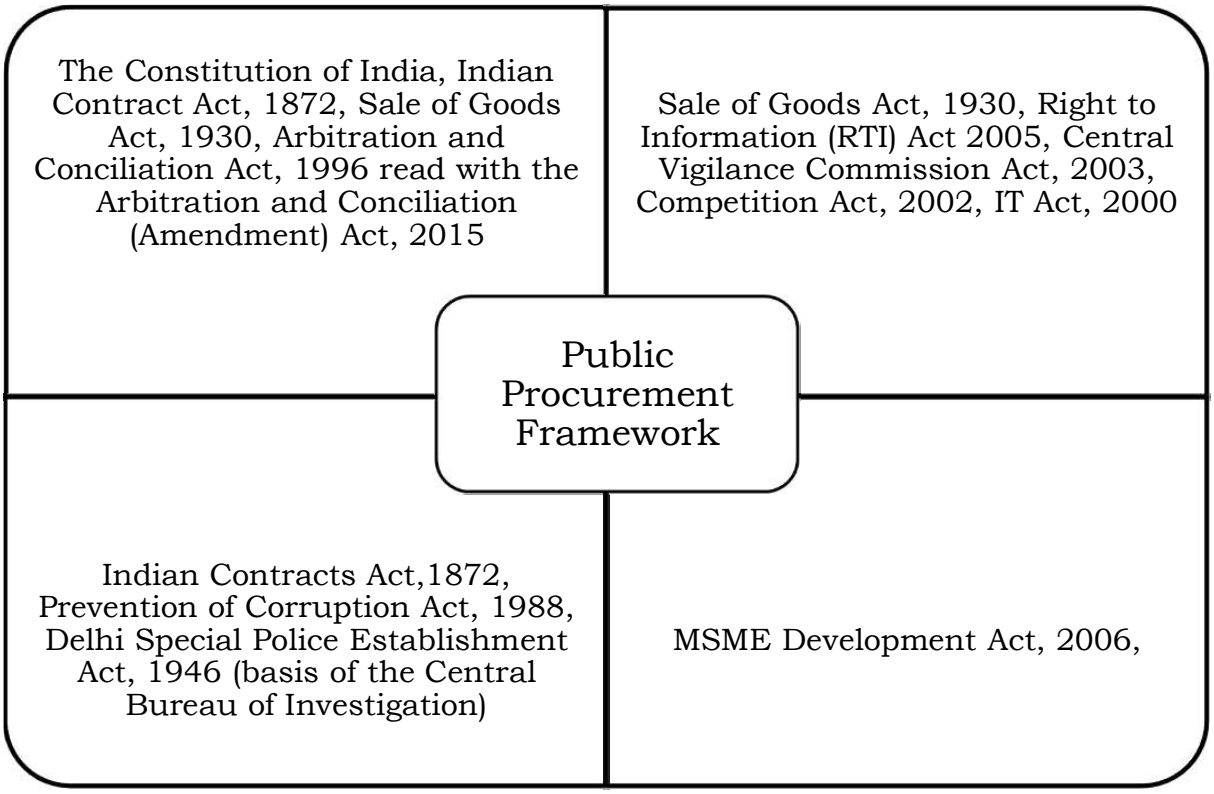

FIGURE – 1: Public Procurement Framework

4. Principles of Public Procurement

There are five main principles which underpin the process of procurement (Siyal & Xin, 2020), as depicted below:-

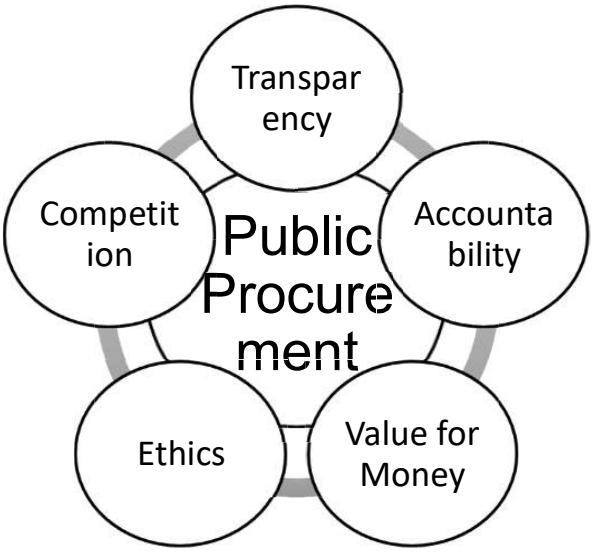

FIGURE – 2: Principles of Public Procurement

5. E-Procurement and its Benefits

E-procurement revolutionises the traditional procurement process by leveraging digital technology. It offers a more effective and efficient procurement process in line with the country's transformation to the knowledge-based economy (K-economy). It is a way for the Government to promote the widespread adoption of e-business in the country. E-procurement helps provide the latest product information and pricing to the Government, which is available online. The system is supposed to be up to date with the latest information that will help the buyer to make a more accurate procurement decision (Nasrun et al., 2016).

The benefits of e-procurement are numerous and far-reaching. First and foremost, it significantly enhances efficiency. With automated processes like electronic requisitions, approvals, and purchase orders, procurement cycles are considerably shortened. The reduction of paperwork is another crucial advantage, eliminating administrative burdens and reducing costs associated with document storage and paper-based processes. In terms of cost savings, e-procurement lowers transaction costs by eliminating expenses such as printing, postage, and manual data entry. Furthermore, it enables organisations to negotiate better deals with suppliers through easy price and term comparisons. The risk of errors in data entry and procurement activities is also minimised, translating to financial savings.

Transparency and accountability are enhanced through e-procurement. The systems maintain a comprehensive audit trail, making it easy to track and verify each step of the procurement process. Real-time access to procurement data provides visibility to all stakeholders, from auditors to management, ensuring compliance with regulatory standards and internal guidelines. Streamlined supplier management is another benefit, as e-procurement systems facilitate better supplier relationships by providing insights into performance, history, and preferences. Suppliers can access the system to view purchase orders, invoices, and payment status, reducing communication and administrative overhead. Strategic decision-making is elevated with data analytics capabilities that offer insights into spending patterns, supplier performance, and market trends. Centralised procurement data empowers organisations to standardise processes, consolidate purchasing power, and leverage economies of scale, furthering strategic goals.

E-procurement also contributes to improved compliance and risk management. It can automatically verify that procurement actions adhere to laws and regulations, reducing compliance risks. These systems also assess and mitigate supply chain risks, promoting a robust risk management strategy. Incorporating sustainability and green procurement initiatives is another key advantage of e-procurement. It allows organisations to assess and manage the environmental impact of their procurement decisions and integrate supplier sustainability and social responsibility ratings into their procurement choices. The mobility and accessibility of e-procurement systems are vital in today's fast-paced world. Stakeholders can access the systems remotely and participate in procurement activities from virtually anywhere, ensuring global reach and greater flexibility. Finally, scalability is an important feature. E-procurement systems can easily expand to accommodate an organisation's growing procurement needs, adapting to handle larger transaction volumes and more complex processes.

In conclusion, e-procurement has become a pivotal tool for modernising procurement practices and reaping a wide array of benefits, including operational efficiency, cost reduction, improved governance, and enhanced strategic decision-making. E-procurement has cut down the time and cost required to generate a purchase order, place the order, determine the nature of contracts, select the right supplier(s), track shipment

status, manage payments, and follow up with supplier(s) (Aboelmaged, 2010). The developmental process of e-procurement technologies in relation to time is as presented below (Chan & Owusu, 2022):-

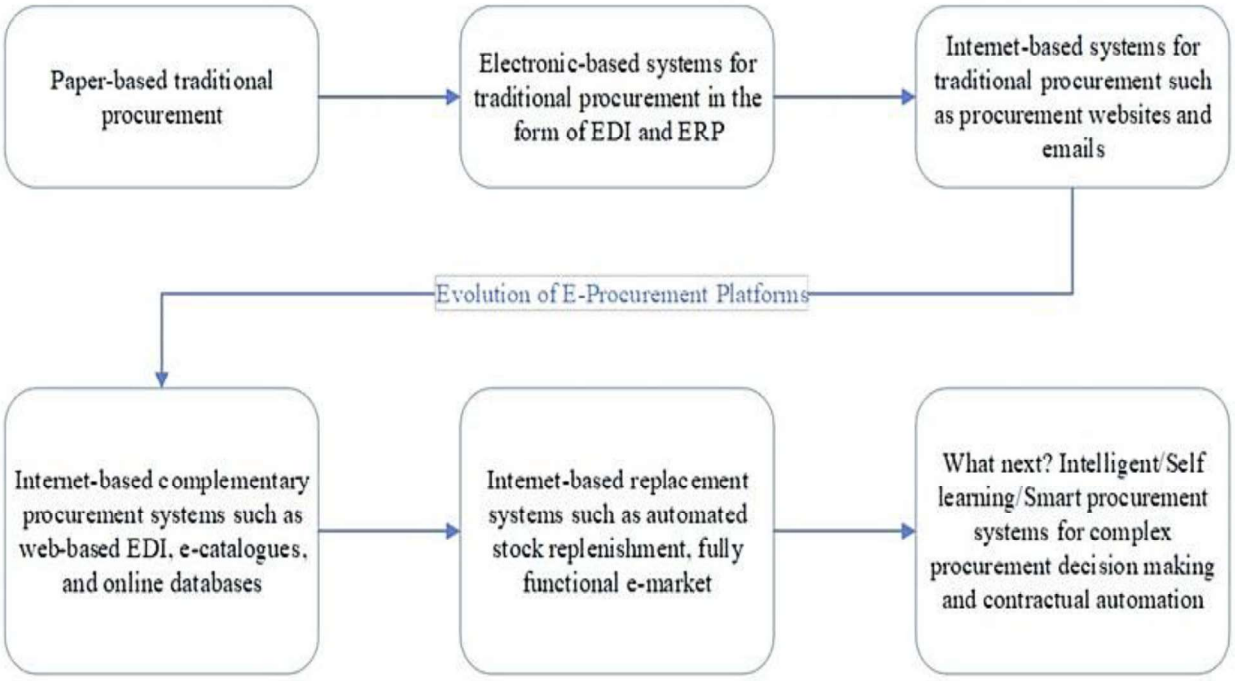

FIGURE – 3: Evolution of EP (adapted from The United Nations Global Marketplace (UNAM) (2012))

6. Government E-Marketplace (Gem): An Overview

It is believed that the most ground-breaking benefits of electronic procurement are still ahead as auxiliary AI tools to facilitate the augmentation continue to get sophisticated and able to execute imaginably impossible tasks a few years ago (Chan & Owusu, 2022). Government e-Marketplace (GeM) represents a transformative initiative in public procurement, especially in countries like India. Launched with the aim of enhancing efficiency, transparency, and inclusivity, GeM is an online platform that facilitates the procurement of goods, services, and works by various government organisations.

The Government e-Marketplace (GeM) portal in India is a web-based public procurement system to facilitate business-to-government (B2G) transactions. The GeM portal is developed and maintained by a special purpose vehicle – GeM- a non-profit organisation under the Ministry of Commerce and Industries, Government of India. With over 5 million sellers and service providers listed on this platform, GeM ensures a complete contactless, paperless, and cashless B2G platform for e-procurement (Ali Alryalat et al., 2023). The Government e-Marketplace (GeM) initiative is thus driven by the need to deliver a significant change in the public procurement process in the country and usher in an era of e-governance by leveraging the power of digital (GeM_handbook, 2018).

GeM promotes transparency in procurement processes. It allows buyers to view multiple seller options, compare prices, and evaluate product specifications, ensuring competitive bidding and fair selection. This transparency fosters trust among buyers

and suppliers. GeM digitises the entire procurement process, eliminating paperwork and manual documentation. Buyers can create, approve, and process purchase orders online, leading to faster and more efficient transactions. This digital approach significantly reduces administrative overhead and operational costs.

For example, as per a government purchaser in the remote Andaman and Nicobar Islands, GeM has brought down the delivery time from 30-60 days earlier to 10-15 days,. Today, GeM caters to 138,000 sellers and 27,000 buyer organisations covering 469,000 products and services. In all, 730,000 orders have been placed so far, with a total value of Rs. 115 Billion (US$ 1.7 Billion). Most of India's states have also signed a Memorandum of Understanding (MoU) with GeM for using this platform for commonly used items (Shanker Lal, 2018).

7. Gem's Role in Promoting Digital Governance

By providing a single, centralised marketplace for government purchases, GeM eliminates much of the paperwork and bureaucracy associated with traditional procurement methods. This not only enhances efficiency but also promotes transparency and accountability - two fundamental pillars of digital governance. GeM enables government entities to procure goods and services with ease, fostering a paperless, online environment. This not only reduces the carbon footprint but also aligns with the Government's commitment to digital India and its environmental responsibilities. Moreover, the platform encourages competition and fair play by bringing in a diverse range of sellers, including small and medium-sized enterprises (SMEs) and local businesses, which is essential for an inclusive and thriving digital economy.

In addition to streamlining procurement, GeM promotes financial inclusivity by ensuring prompt payments to vendors, furthering the Government's mission of financial inclusion. Furthermore, the platform's data analytics and reporting capabilities provide valuable insights that enable data-driven decision-making and efficient resource allocation, essential elements of good governance.

By serving as a catalyst for efficient, transparent, and accountable procurement, GeM underscores the transformative potential of digital governance in India. It not only simplifies the procurement process but also aligns with the nation's broader vision of becoming a digitally empowered and environmentally responsible country. In this way, GeM stands as a shining example of how technology can drive good governance practices and contribute to the overall progress of the nation.

8. Research Methodology

A prospective and observational study was designed to analyse the procurement process in a government office with an annual budgetary outlay of Rs 500 Crs. For data collection, the conventional procurement process and GeM-based were studied in detail and compared. The researcher employed the cross-sectional survey method. The research benefited from two main data sources: primary and secondary. Primary data was collected through structured questionnaires and personal interviews of 100 government procurement professionals. The secondary data, on the other hand, was used to help bring a general understanding to the research. Qualitative data was gathered and used as part of the research. The research approach was descriptive and explanatory study. Also, data was solicited from textbooks and relevant academic journals that relate to the research topic mainly for the literature review. The researcher used frequencies to represent the time elapsed in every stage of procurement from the time of receipt of demand to materialisation of demand, which was noted in both procurement methodologies. The data was entered into MS Excel and analysed.

9. Activities Involved in A Procurement Process

The procurement process may vary from organisation to organisation, vendor to vendor, business to business and platform to platform. A typical public procurement process flow chart is depicted in Figure 2. The process may vary slightly depending on the departmental rules in vogue. The process depicted in the figure may be abridged at the discretion of the Competent Financial Authority (CFA) on a case-to-case basis on operational necessity (Panda et al., 2012). However, the fundamental steps involved in any public procurement process can be summarised as follows:-

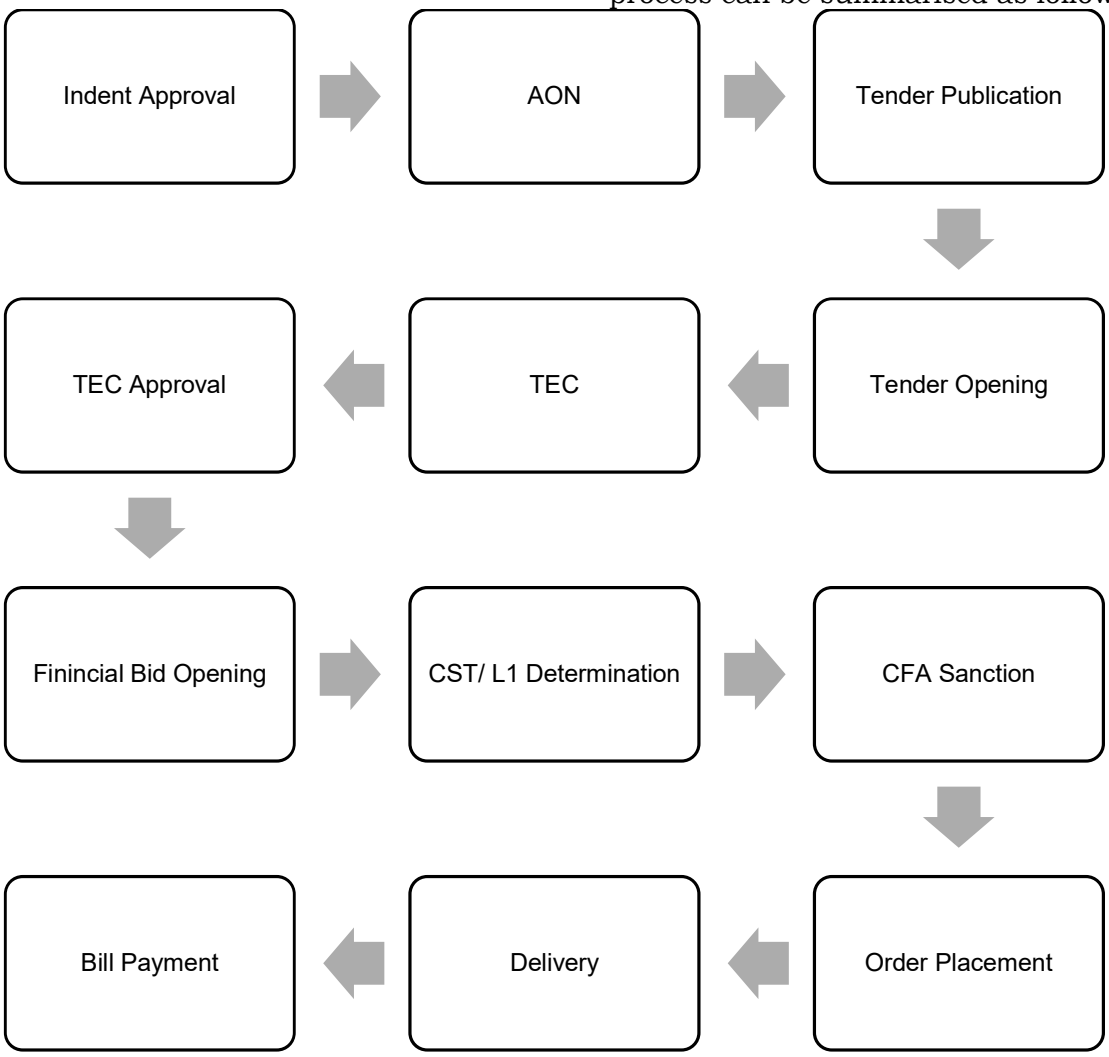

FIGURE – 4: A Typical Public Procurement Process

10. Traditional Procurement Vs Gem Procurement Procurement Cycle/ Lead Time Analysis

The procurement system where all activities and processing are carried out manually is termed a traditional procurement system. On the other hand, the way of contracting sellers or service providers to provide both goods and services via electronic means involving the internet through the online GeM portal is termed GeM procurement. A comparison between traditional procurement and the GeM procurement system is given in the following table:

TABLE – 1:
TRADITIONAL PROCUREMENT VS. GEM PROCUREMENT

Ser	Stage of Procurement	Timelines of Paper-Based Procurement (in Days)	Timeline of GeM-Based Procurement (in Days)
(i)	AON	56	42
(ii)	Tender Publication	21	10
(iii)	Tender Opening	02	01
(iv)	Tender Evaluation Committee (TEC)	21	04
(v)	TEC Approval	07	07
(vi)	Financial Bid Opening	07	01
(vii)	CST/ L1 determine/RA	07	02
(viii)	Sanction	07	07
(ix)	Order Placement	10	02
(x)	Delivery	As per order	As per order
(xi)	Bill Payment	42	14
Total No. of days in the procurement cycle		**180 days**	**90 days**

Reducing the procurement cycle from 180 days to 90 days signifies a significant enhancement in efficiency and cost-effectiveness within the procurement process. This 50% reduction in the time taken for procurement implies several positive outcomes:-

i. **Time Savings:** The halving of the procurement cycle indicates a substantial reduction in time-related expenses and resource allocation. This shortened timeline translates to quicker access to goods and services, improving operational agility.

ii. **Cost Reduction:** Cutting the procurement cycle by half has significantly lower administrative costs, paperwork expenses, and associated overheads. This reduction contributes to overall cost savings for the government.

iii. **Improved Resource Utilisation:** The quicker procurement cycle enables more efficient utilisation of resources, including manpower, infrastructure, and financial resources, fostering better resource management and allocation.

iv. **Enhanced Operational Efficiency:** A shorter procurement cycle implies smoother and more responsive operations, allowing government agencies to meet their needs faster. This increased efficiency positively impacts service delivery and responsiveness.

v. **Boosted Vendor Confidence:** Quicker procurement processes attract more vendors and foster a healthier vendor ecosystem. Shorter cycles also encourage vendors to participate more actively, promoting competition and potentially driving down costs.

vi. **Reduced Risk Exposure:** Shorter procurement cycles reduce the exposure to market fluctuations, minimising the risk of price variations and uncertainties associated with longer procurement timelines.

vii. **Compliance and Transparency:** A shorter cycle necessitates streamlined and standardised processes, leading to better compliance and improved transparency throughout the procurement journey.

Cost-Effectiveness Analysis

A cost-effectiveness analysis of Government e-Marketplace (GeM) versus paper-based procurement involves assessing the financial implications of each procurement method, which was undertaken for 100 sample procurement cases. Below is a comparative analysis:

TABLE – 2:
TRADITIONAL PROCUREMENT VS. E-PROCUREMENT

Aspect	GeM	Paper-Based Procurement
Procurement Process Costs	Reduced administrative costs, lower paperwork expenses	Higher administrative costs, extensive paperwork, and manual data entry
Vendor Management Costs	Simplified vendor management, lower administrative overhead	Manual vendor verifications and time-consuming processes
Transparency and Accountability Costs	Reduced risk of corruption and disputes	Potential legal and financial repercussions due to lack of transparency
Compliance Costs	Standardised templates and guidelines reduce the risk of non-compliance	Higher costs due to more manual compliance checks
Data Analytics and Reporting Costs	Cost savings through data-driven decision-making	Potentially suboptimal resource allocation due to limited data analytics
Security and Fraud Prevention Costs	Investments in robust security measures for fraud prevention	More susceptible to fraud, leading to potential financial losses

The cost-effectiveness analysis favours GeM over paper-based procurement. GeM offers significant cost savings by reducing administrative, paperwork, compliance, and legal expenses. It enhances transparency, which can prevent costly controversies, disputes, and corruption. Additionally, GeM's data analytics capabilities contribute to cost-effective resource allocation and decision-making. While there may be an initial investment in technology and training for GeM, the long-term savings and efficiencies it offers make it a financially prudent choice for public procurement.

11. Challenges in Implementing E-Marketplaces

Implementing Government E-Marketplaces (GeMs) comes with its set of challenges due to the unique nature of public procurement and the need for transparency, compliance, and cost-efficiency. Based on the interview of procurement professionals of the central government departments, the challenges are as summarised below:-

- **Resistance to Change:** Public sector employees and stakeholders are resistant to adopting new e-marketplace systems as they are accustomed to traditional procurement methods. Overcoming this resistance requires comprehensive change management strategies.

- **Complex Integration:** Integrating GeM with existing government systems, such as ERP and accounting software has been complex and time-consuming. Ensuring seamless data flow and compatibility should be the priority.

- **Data Security and Compliance:** GeM handles sensitive government data and personal information. Ensuring data security and compliance with data protection regulations should be of paramount importance.

- **Supplier Onboarding:** Onboarding a wide range of suppliers, including smaller enterprises, onto the platform can be challenging, as they have varying levels of technological readiness and need education to use the system effectively.

- **User Training:** Adequate training is essential to ensure government employees can effectively use the GeM platform. Insufficient training can lead to inefficiencies and errors in procurement processes.

- **Regulatory Compliance:** Government procurement is subject to various regulations, tax laws, and industry-specific standards. Adapting the GeM platform to remain compliant is an ongoing challenge.

- **Customisation Needs:** Government procurement processes can be highly specific and require tailored features within the GeM platform. Striking a balance between customisation and maintaining a standardised, user-friendly interface is challenging.

- **Supplier Management:** Effective management of suppliers, including performance evaluations and monitoring would be vital for the integrity of the procurement process.

- **User Experience:** GeM platform needs to offer an intuitive interface and smooth user experience to encourage adoption among government employees and suppliers.

- **Data Analytics:** Implementing effective data analytics tools to gain insights from procurement data is a critical challenge, and requires to be undertaken for better decision making.

- **Interoperability:** GeM needs to be seamlessly integrated with all government systems for efficient data exchange and streamlined procurement processes.

Addressing these challenges necessitates meticulous planning, close collaboration with stakeholders, investment in technology and cybersecurity, continuous training, and an adaptive approach to regulatory compliance. The successful implementation of Government e-Marketplace can significantly improve transparency, efficiency, and cost-effectiveness in public procurement processes.

12. Recommendations for Improving GeM's Efficiency and Effectiveness

To enhance the efficiency and effectiveness of the Government e-Marketplace (GeM), several key recommendations should be considered. Firstly, GeM should prioritise the development of a user-friendly interface, ensuring it is intuitive and accessible, particularly on mobile devices, to cater to a wide range of users. Simplifying the registration process and implementing a swift verification system for both buyers and sellers is crucial for quick onboarding. Improving the platform's search and filtering functions will enable users to find products and services more efficiently. Moreover, providing robust user support through comprehensive training programs and a dedicated helpdesk will empower users to navigate the platform effectively. GeM should also establish a transparent feedback mechanism, allowing users to

report issues and offer suggestions, fostering a continuous improvement cycle. Furthermore, integrating GeM with e-procurement and financial systems streamlines the procurement process, reducing manual intervention. The platform should explore advanced technologies such as blockchain to bolster security and transparency in transactions. Standardising product classifications and descriptions will eliminate ambiguity, aiding in easier product comparisons.

In addition to these technological advancements, GeM should prioritise cybersecurity measures to safeguard sensitive government data. Incorporating criteria for eco-friendly products and services promotes green procurement, aligning with sustainable practices. Establishing clear performance metrics, regularly evaluating them, and ensuring compliance with legal and regulatory frameworks are vital for maintaining the platform's integrity. Multi-lingual support should be provided to cater to diverse linguistic backgrounds, enhancing inclusivity. Finally, a culture of continuous innovation should be fostered within GeM, ensuring that the platform remains abreast of the latest technological advancements and user requirements. By implementing these recommendations, GeM can transform into a highly efficient, user-friendly, and transparent platform, revolutionising government procurement processes and facilitating better service delivery.

13. Conclusion

GeM's adoption of digital technology brings about remarkable efficiency gains, notably reducing procurement lead time from vendor onboarding to transaction completion. Moreover, GeM contributes to promoting transparency and accountability, offering a centralised platform for real-time tracking and traceability, mitigating the risks of corruption and non-compliance with government regulations.

The cost-saving potential of GeM is substantial, driven by competitive pricing, bulk purchasing options, and direct deals, presenting a cost-efficient alternative to traditional procurement practices. Importantly, GeM's inclusive approach encourages a diverse range of vendors, including SMEs, furthering competition and inclusivity in government procurement. Overall, GeM represents a transformative model for public procurement, fostering efficiency, transparency, cost savings, inclusivity, and accountability, and stands as a beacon of how technology can revolutionise and enhance the effectiveness of government procurement practices.

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Chief Editor

Problem areas in Public Procurement – Preventive Vigilance Measures Thereof

VINAY SHANDILYA*

ABSTRACT

Public procurement is an essential process for purchasing goods, works, and services by the government, public sector undertakings, and local bodies. However, this process is prone to corruption, which can lead to a significant loss of public money. Therefore, preventive vigilance measures are essential to ensure that public procurement is conducted with probity. The paper discusses the initiatives, challenges, and preventive measures taken in the Indian public procurement system. It also sheds light on the problem areas of corruption in construction contracts and the lapses observed. The paper concludes by providing suggestions for preventive vigilance measures to be taken at various stages in public procurement.

Keywords: Public Procurement, preventive vigilance, tendering
JEL Classifications:

1. Introduction

Public procurement covers the procurement of goods, works and services by all government ministries, departments, agencies, statutory corporations and public sector undertakings in the Centre and the States, Municipal Corporations and other Local bodies and even by private sector undertakings providing public service on a monopoly basis. Tendering and contracting is the procedure through which procurement takes place.

Public procurement accounts for a significant level of public spending. It accounts for about 15% of GDP across the countries, 20% of Government expenditure for OECD countries and around 20-25 % of GDP in India. Government expenditure for public procurement in India has grown from INR 6, 92,177.78 crores to 15, 84,891.7 crores in the last five years (Approx. 129%) (2015-16 to 2019-20) as per Government e-Procurement run by National Informatics Centre (GePNIC) (see the Table below.

In India, these are the following five major government bodies to check the procurement probity:

(i) Procurement policy Directorate of Ministry of Finance: - Deals with policy issues.
(ii) CAG Addresses probity issues and advises, and disciplinary actions. Issues guidelines on.
(iii) CVC public Procurement, advisory in nature.
(iv) CCI - Deals with anti-competitive elements.
(v) CBI - Deals with investigation and prosecution of criminal cases.

These are the five watchwords of public procurement
1. Transparency
2. Fairness
3. Value for money
4. Quality
5. Time

* CTE, Ministry of Defence

TABLE – 1:
NUMBER OF TENDERS FLOATED IN THE CENTRAL PUBLIC PROCUREMENT PORTAL (CPPP)

Year	No of E-Tenders	Value of Tenders (in Crores)
2015-16	5,13,842	6,92,177.78
2016-17	6,81,971	8,90,968.84
2017-18	11,11,230	19,58,787.38
2018-19	13,67,149	18,07,951.49
2019-20	13,15,769	15,84,891.71

2. Initiatives, Challenges and Preventive Measures Taken in the Public Procurement System

2.1 Initiatives

Recently there have been certain initiatives to promote transparency and openness in India which are discussed below:

1. **Right to Information Act 2005:** Its objective was to promote openness, transparency and accountability in administration.
2. **Integrity Pact:** It is a tool to build transparency in public procurement via a voluntary agreement between the purchaser and the bidder. There is a mutual undertaking that the officials of the purchaser department will not demand or accept bribes, gifts etc. and the bidder has not paid or will not pay any bribe etc. There is also the provision of Independent External Monitors (IEMs), who deal with the complaints arising out of any procurement issue.

Definition of Vigilance Angle as per CVC Manual: Interalia the following aspects are included in the Vigilance-Angle:-

Bribery, disproportionate assets, pecuniary benefits, loss to the state, recklessness in decision making, gross violation of rules/procedures, undue benefit to the contractor, delay in decision making, any action taken with malafide intent, discretion in excess, discrimination, arbitrariness and not keeping higher-ups informed of the important-matters etc.

2.2 *Challenges in the Indian Public Procurement System*

Major challenges in the Indian public procurement system are the following:

(i) Absence of Comprehensive Procurement Act: In the absence of a comprehensive procurement Act, undertaking comprehensive actions against the stakeholders involved in unfair practices becomes challenging and the action is possible only under the Conduct Rules applicable to the employee.

(ii) Lack of Standard Bid document: There continues to be a multiplicity of bid documents across the entities.

(iii) Delays: In construction projects, there are delays at all stages particularly in Land Acquisition.

(iv) Unfair Practices and Corruption: Given the size and interests of the stakeholders, tendering and contracting are vulnerable to unfair practices thus imposing high costs on the Government and society.

(v) Presence of Anti-competitive Elements: Certain bidders are involved in collusive bidding and abuse of dominance.

(vi) Absence of Independent Grievance Redressal Mechanism: If we leave aside the system of Independent External Monitors (IEMs), there is hardly any independent grievance redressal system prevalent in most government departments.

(vii) Competence/Skill of Procurement Officers: Most of the departments of

Government do not have a dedicated cadre to deal with contractual issues. Quantity surveying and contracts cadre of Military Engineer Services (MES) and Indian Railway Stores Service (IRSS) of Indian Railways are perhaps the only exception.

2.3 Preventive Measures

Preventive Measures suggested to deal with the above challenges are:

(i) Procurement manual should be updated periodically suiting the requirement.

(ii) Dedicated cadre to deal with procurement issues.

(iii) Enactment of Procurement Act: This is imperative to provide the best value for public money.

(iv) Standard and uniform bid documents: There should be identical procurement of works, goods and services across various Ministries/Departments (barring organisation specific naunces). This will also promote ease of business.

(v) An effective procurement management Information system: It is very important for a sound and sustained procurement system. It serves as the data centre to asses and tracks current and past tenders. It also helps in bid preparation and evaluation.

(vi) Establishment of an independent and decentralised grievance redressal system: This is crucial for building public confidence in the procurement system.

2.4 Stages in Public Procurement of Works

Following are the four stages in public procurement particularly for procurement of works:

(i) Pre-Tender Stage: It involves Project formulation, appointment of consultants, of detailed project report (estimate, design etc.)

(ii) Tender Stage: It involves the preparation of tender documents, inviting and opening of tenders, prequalification and tender evaluation and award of work.

(iii) Execution stage: It involves:-

a) Agreement/purchase order
b) Contract performance
c) Advance payments
d) Implementation of contract provisions
e) Time and cost overruns
f) Payments
g) Quality of work/ inspection

(iv) Dispute Resolution: The last stage in Public Procurement (if required) is Dispute Resolution which involves DRB, Amicable settlement Arbitration etc.

3. Preventive Measures To Be Taken In Various Stages Of Public Procurement

3.1 Pre-Tender Stage

i. Project Formulation/Planning

A comprehensive plan helps to avoid glaring deviations and delays during execution as it is said that today's problems are due to yesterday's short-sighted solutions. Hence comprehensive planning is very important.

ii. Appointment of Consultant: The following points to be kept in mind while appointing the consultants:

a. The Department should formulate guidelines for the appointment of consultants.
b. The decision-making should be retained with executives and the consultant's role should be only advisory.

c. Fix the upper ceiling for the fees of consultants.
d. Provide safeguards against consultant's failure such as a performance guarantee.
e. Fix rates for repetitive work, so that the consultants are not paid extra huge sums for the repetitive work.
f. Consultants are not to be appointed if an in-house facility is available.
g. Consultants should not be allowed to pass on their responsibility to the contractor.

iii. Preparation of Detailed Project Report (Estimate, Design etc.)

a. Prepare DPR as per actual site requirement otherwise, it may lead to deviations and delays.
b. Ensure conformity among nomenclature of items, drawings and specifications to avoid ambiguities at a later stage. Ambiguities in tender documents lead to disputes.
c. Finalise the DPR in consultation with field staff.
d. There must be a yardstick prescribed for various requirements to safeguard public money against its misuse.

3.2 Tender stage

i. Preparation of tender documents

a) Adopt updated and standard bidding document
b) Ensure conformity among nomenclature of items, specifications, drawings, general and special conditions to avoid ambiguity and conflicting provisions.
c) Drafting of tenders should be done in simple language
d) Avoid stipulating such conditions in the contract that are not feasible to operate.
e) Conduct pre-bid meetings to bring clarity regarding the spirit of various provisions and to bring necessary modifications, if required.
f) Provide a clause in the Tender conditions to deal with the ambiguous provisions.
g) Objective evaluation criteria should be notified in the tender document.
h) Stipulate all prevailing government. Policy orders such as purchase preference policy, tax deducted at source (TDS) etc.

There can be the following modes of tendering:

a) Open with or without filter condition.
b) Limited (generally adopted for small value, urgent and repetitive procurements)
c) Single (without calling tender, generally adopted for proprietary items and emergency situations)

Every organisation should frame a policy for deciding the mode of tendering.

ii. Inviting Tenders: While inviting tenders following things are to be kept in mind:-

a) Prefer open tendering as far as possible.
b) In case limited tenders are resorted to, prepare a panel of contractors/ vendors in a fair and transparent way.
c) Ensure adequate and wide publicity of NIT.
d) Ensure adequate time for submission of offers.
e) Upload NIT and tender documents on the Departmental website beside the Public Procurement Portal, even in case of limited tenders.
f) Bidding documents should include a clause- if a firm quoted 'nil' charges, the bid shall be treated as non-responsive (Rule 173 (h) GFR). As per the Indian Contract Act, any contract agreement without consideration is void.
g) Disclosure of the conflict-of-interest clause should be there.
h) Open tenders by a committee on an appointed date and time.
i) Prepare an 'on the spot' summary.
j) In case of manual tender open the bid in the presence of bidders, as far as possible.

iii. Prequalification

The objective of prequalification is to bring competent contractors into the competition having technical and financial capabilities commensurate with the requirements of the particular tender.

The following are important aspects to be kept in mind for deciding prequalification (PQ) criteria and allied matters:

a) Keep the PQ criteria neither too stringent nor too lax.
b) Prepare the PQ criteria specific to the requirement of the work in clear terms.
c) Notify the evaluation criteria in the PQ document
d) Verify PQ credentials.
e) Evaluate the bids exactly as per the notified criteria. There should be no room for any discretion in such matters.
f) Do not dilute the scope, specification and conditions of the contract after opening of the bids.
g) No negotiation with any contractor after the opening of tenders. Any negotiation may have a vigilance angle.
h) We should have the justification of the accepted rates/amount.
i) Fund availability to administrative approval should be ensured while accepting the tender.

3.3 Execution Stage

The following are to be complied with at this stage:

a) Match the agreement with the tender document and sign the same.
b) Do not deviate from any contract condition. Contractors tend to take undue advantage, whenever any deviation is there.
c) Verify the authenticity of bank guarantee and monitor their validity.
d) Do not make overpayments at any stage.
e) Technical examination of work may be done by any independent agency.

3.4 *Disputes – Resolution /Arbitration*

Only persons of very high integrity should be appointed as members of the Dispute resolution board/panel of arbitration, because a large sum of money as claims is involved in the process of Dispute resolution/Arbitration. Therefore, this process is vulnerable to corrupt practices.

4. Problem Areas of Corruption in Construction Contracts

The following are the problem areas:

i. Inflated estimates
ii. Major changes during execution
iii. Conflicting vague and ambiguous provisions in tenders
iv. Restrictive or too lax PQ criteria
v. Rate only item
vi. Unworkable period of construction (Leads to frequent grant of extension of time (EOT), litigation and corruption
vii. Particular brand of product stipulated (To favour a particular contractor/manufacturer)
viii. Incorrect type of contract followed.
ix. Rejection of tenders on irrelevant considerations.
x. Deletion of items after the opening of price Bid (To favour a particular contractor)
xi. A sufficient number of technical staff not employed
xii. Quantity of abnormally high-rate items executed in excess and vice-versa to grant undue benefit to the contractor.
xiii. Poor quality of construction
xiv. Inferior quality of materials procured and used in work.
xv. Resorting to re-tender without proper evaluation of quoted rates.
xvi. In lump-sum tenders, incorrect pre-pricing may lead to unbalanced quotations.
xvii. Incorrect quantities in item rate contracts (adequate ground data needs to be collected), create a problem in executing abnormally high rate and abnormally low-rate Items.
xviii. Inclusion of yardstick in lumpsum contracts. (To avoid overpayment)
xix. Front-loading of tenders: Results in over-payment to contractors and then they abandon the work.

xx. Cancellation and termination of contract without taking into consideration all the relevant factors.
xxi. The deviation limit to be specified in the contract
xxii. Extension of time (EOT) on flimsy grounds
xxiii. Delayed payment to contractors.
xxiv. Bogus testing Labs in the tender documents.

4.1 Winner's Curse

This term was first coined in 1950. It occurs in common value competitive auctions/tenders where some degree of uncertainty is involved. The winner over-competes in a bid to win the tender and tends to under-quote due to emotional reasons/incomplete information. The person who under-quotes wins the tender. The more bidders there are, the greater the likelihood of the winner's curse. This may result in a loss to the L-1 bidder or may result in a reduced margin of profit.

Williams Vickrey (Vickrey-Auction) suggested the following procedure for auctions to avoid the winner's curse:

i. The highest bidder wins but the price paid is of the second-highest bid
ii. The dominant strategy of each bidder is to bid their true value of the item (No under-bidding or over-bidding).
iii. However, it is vulnerable to collusion. He won the Nobel Prize for developing this theory.

5. Lapses Observed

Following lapses were observed while working in one of the vigilance-wing of the Government of India:

A. PQ Criteria

i. The average turnover mentioned in the PQ criteria of one of the tenders was Rs 70 crore, however, the turnover of Rs 67 crore in respect of one of the contractors was accepted citing the reason that they are respectable contractors and working in the Department for a long period. Hence irrelevant factors were given undue weightage.
ii. One of the authorities had discriminated for the functional requirement of the building rather than the technical parameters e.g. experience of the college building was to qualify but experience of the school building (which could be bigger) was not to be considered for pre-qualification.
iii. The contractor who had not submitted the earnest money by the due date was considered subsequently by carrying out re-evaluation when the contractor submitted earnest money after the due date.
iv. One of the works costing Rs 60 crores had an equal component of building work, services and runway, however in pre-qualification criteria, only the experience of the runway was to be considered ignoring experience in the other two types of works of equal component, thus restricting the completion.
v. In one of the organisations, the experience of road work carried out at a height of 500 m or above only was to be considered, thus entirely ignoring the experience of road work in plains which may be of larger magnitude.
vi. In one of the organisations the joint venture established before the issue of NIT was only to be considered.

B. Miscellaneous

In one of the organisations, the abnormally low and abnormally high-rate items were allowed to be varied giving unintended benefit to the contractor, although overall the deviation limit was not burst.

i. Time-barred/stale claims were revived by carrying out insignificant amendments to the contract after 20 years of completion of work.
ii. In one of the cases, due to the wrong interpretation of the contract clause for reimbursement, the overpayment

to the extent of approximately Rs 8 crore was made to the contractor.

iii. Wrong refund of GST: GST has replaced other taxes but the entire amount of GST levied after acceptance of the contract was refunded without accounting for taxes prevalent before acceptance of the contract.

iv. In one of the contract-agreement it was observed that makes of cement/steel could be approved even after acceptance of the contract, which could give unintended benefit to the contractor.

v. Excess procurement of ACs: In one of the organisations two wings of the same department working under the same Accepting-officer procured the same ACs thus causing excess procurement.

vi. Change of Site: The site of the building was changed although everything including earthwork and excavation was included in the lump-sum contract.

vii. Single make: Single make for a major item was only mentioned in bid document.

viii. Approval of make: The make that was not mentioned in the bid document was approved without ascertaining its non-availability in the market.

ix. Selective amendment to work load returns: In one Department the system of workload returns governs the banning of contractors. Workload returns are issued quarterly. Selective amendment in between the quarters was observed to favour some of the contractors.

6. Preventive Vigilance Study

A preventive vigilance study covering the topics of product approval and renewal, Upgradation and enlistment of contractors in a Department was undertaken and the following preventive vigilance measures were suggested and accepted by the CEO of the Department:

A. Product Approval

i. Process of inviting requests for approval from manufacturers and its processing online should be completed at the earliest.

ii. A time limit should be prescribed for approval of any make/brand after receipt of application from the manufacturers and these timelines should be strictly adhered to.

iii. There is a need for provision of appeal to the next higher authority in case any manufacturer feels aggrieved from the decision of their product being rejected by any authority.

iv. Such policies may not be kept in a restricted domain, rather these should be kept in the open domain on the website of the organisation.

B. Renewal, upgradation and enlistment of contractors

To reduce the opportunities for corruption in this process, the following advice has been given to Departmental authorities for their further necessary action on the subject matter:

i. Leveraging technology: The complete Enlistment and Renewal process may be made compulsorily online in a time-bound manner thus reducing any human interface and increasing transparency.

ii. Accountability: Timeline should be laid down and strictly enforced for disposal of each enlistment and renewal case of the contractor. The officers grossly delaying the cases need to be identified and made accountable for delay at their end.

iii. Simplification of procedure**:** The procedure for enlistment and renewal may be simplified and number of documents asked may be reduced. Alternatively, all

contractors other than those not found fit for renewal will be renewed automatically.

iv. Extension of time**:** Sufficient time needs to be given to the contractor for submitting the application and related documents for renewal. Thereafter, further extension should not be given arbitrarily.

v. Provision for appeal**:** There should be a provision for appeal to the next higher authority in case any contractor feels aggrieved.

6.1 Preventive vigilance measures in general as suggested by the CVC

Following prevention vigilance measures have been suggested by the CVC:-

i. Standardisation and simplification of rules and procedures: This facilitates the elimination of discretion and arbitrariness and helps reduce corruption.

ii. Automation and leveraging technology: Technology plays an enabling & and effective role in fighting corruption and reduces human interface.

iii. Transparency: It removes asymmetry of information between the public and public officials thus reducing corruption.

iv. Accountability: A system with clear accountability & assigned responsibility at each level is necessary for smooth functioning & ensuring timely and effective punitive action in case of misconduct.

v. Control and supervision: Regular and routine inspections keep a check on corrupt behaviour.

vi. Training and awareness: Capacity building, knowledge sharing initiatives and training on rules and regulations etc. help in preventive vigilance.

vii. Awareness among the Public: If the public is made aware of the rules and regulations, then they may be able to resist unfair treatment and arbitrary exercise of power by the public.

6.2 Way Forward / Recommendations:

The following are some of the recommendations related to public procurement with emphasis on vigilance aspects:

i. Independent Grievance Redressal Mechanism: It is essential for public confidence in the procurement process.

ii. Effective leadership in public procurement: This can bring about reforms and institute best practices and bring integration in various departments. The top leadership of organisations needs to be more involved in the procurement process.

iii. Standardisation of bid documents and procedures is essential for the seamless procurement process.

iv. Procurement Management Information System (PMIS): It helps in tracking ongoing and completed contracts and acts as a data bank.

v. Professionalising the function of public procurement: A dedicated cadre of officers to deal with procurement, capacity building and training are essentially required for an effective procurement process.

vi. Use of IT, online processing of all functions from Notice Inviting Tender (NIT) to final bill payment

vii. Presence of strong anti-trust and anti-competition agency

viii. The design of tenders should be such that bidders' ability and incentive to reach collusive arrangements are reduced.

ix. Blacklisting rules for corrupt firms to be revamped and strictly enforced

x. Reduce unnecessary entry barriers for firms/products

Smart Contract in Public Procurement in India: Pros and Cons

BRAJESH KUMAR*

ABSTRACT

This paper explores the potential of smart contracts in public procurement and supply chain management in India. The study starts by providing an overview of the history of smart contracts, highlighting their potential benefits and challenges, and their applications in various sectors. The paper then focuses on the Indian public procurement system, examining the challenges faced by the system, such as corruption, delays, and lack of transparency. It then discusses the benefits of smart contracts in simplifying the procurement process, reducing transaction costs, and enhancing transparency and traceability in the supply chain. It concludes by recommending measures to address the challenges and facilitate the adoption of smart contracts in public procurement and supply chain management in India.

Keywords:
JEL Classification:

1. Introduction

The use of smart contracts is becoming increasingly popular across the world, especially in the public sector procurement industry. In India, the adoption of this technology has been relatively slow, but there are indications that it could be the solution to some of the challenges facing public procurement. Smart contracts are digital contracts that automatically take effect when certain criteria are met. These hold the potential to revolutionise traditional contractual procedures and are transforming various sectors, including public procurement and supply chain management. Smart contracts have a key role in streamlining and automating these processes, offering enhanced security, transparency, and efficiency to the government and businesses.

The public procurement process is highly complex and involves multiple stakeholders, including government bodies, vendors, intermediaries, and end-users. Smart contracts can simplify this process by enabling automatic execution of the procurement agreement when predefined conditions are met. The use of smart contracts can eliminate the need for intermediaries or third parties, thereby reducing transaction costs and enhancing transparency. The decentralised nature of smart contracts makes them resistant to fraud, corruption, or errors, leading to a more secure and trustworthy procurement process.

In supply chain management, smart contracts can facilitate effective management of the supply chain by offering a decentralised platform for sourcing, production, shipping, and delivery. Smart contracts can eliminate the

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need for multiple intermediaries, and their self-executing features can enhance the accuracy and speed of the supply chain process. For instance, smart contracts can automatically trigger a transfer of funds to suppliers when they deliver the goods, thereby ensuring that suppliers are paid promptly, and reducing the likelihood of disputes or delays.

The use of smart contracts in supply chain management can also enhance transparency and traceability. By leveraging block chain technology, smart contracts can create an immutable and transparent record of all transactions, from the production to the delivery of goods. This can help businesses to identify bottlenecks and optimise their supply chain processes while providing end-users with greater visibility into the sourcing and production of the products they purchase.

However, the implementation of smart contracts in public procurement and supply chain management requires careful consideration of legal frameworks and interoperability standards. Governments and businesses need to work together to develop standardised procedures, a common language and protocols to facilitate the adoption of smart contracts. Additionally, education and training on smart contracts are necessary for stakeholders to understand their potential and how they can be used effectively in their respective sectors.

Smart contracts have been gaining popularity in recent years, with their potential to revolutionise the way we conduct transactions. This technology has found its way into various industries, including public procurement in India. This study looks at what smart contracts are, their pros and cons when applied to public procurement systems in India, successful implementation case studies, challenges to widespread adoption, and recommendations for future implementation.

2. History of Smart Contracts

Smart contracting was first introduced by Nick Szabo back around 1994. Szabo envisioned a system whereby a set of rules and conditions could be programmed into a digital document or code, which could then be executed automatically when certain conditions, such as a predetermined date or specific event, were met. This approach, he argued, could eliminate the need for intermediaries, such as lawyers or escrow agents, to enforce agreements or carry out transactions.

He later expanded his research around 1996 proposing concepts behind encryption software protocols involving electronic commerce and creating decentralised autonomous organisations (DAO) concepts eventually realised via the Ethereum network' rise since then powered Ethereum Virtual Machine brought great innovation enabling developers to create decentralised apps (DApps) entering marketplaces offering unique features disrupting industries fundamentally changing economies underlying foundations over time!

Szabo's original vision for smart contracts drew heavily on the notion of "micropayments" and automated financial transactions. He proposed using the technology to enable more efficient and secure electronic commerce, as well as to help reduce fraud and minimise the costs associated with traditional intermediaries.

Over the years, interest in smart contracts ebbed and flowed, with some early experiments showing promise, but many challenges remained. One critical issue was the lack of a suitable digital infrastructure and protocols to support the execution of smart contract code in a way that was secure, reliable, and standardised.

Eventually, the emergence of block chain technology—the underlying infrastructure that powers crypto currencies like Bit coin—provided a platform on which smart contracts could be built and executed. This was thanks to the unique architecture of block chain technology, which allowed a decentralised network of computers to validate and execute transactions securely and

automatically, without the need for intermediaries.

Today, smart contracts have become a fundamental component of the block chain ecosystem, powering everything from decentralised finance to supply chain management and beyond. They have also attracted the attention of a wide range of industries, including banking, real estate, insurance, and more, as organisations seek to leverage technology to streamline operations and reduce costs.

Looking to the future, the possibilities for smart contracts are vast, with many predicting that they could revolutionise the way we do business, govern societies, and even interact with one another on a global scale. However, as with any new technology, there are also risks and challenges that must be addressed, including regulatory concerns, security issues, and the need for standardisation and interoperability across different block chain platforms. Nonetheless, as the history of smart contracts shows, the potential benefits of this ground breaking technology are simply too great to ignore, and we can expect to see continued innovation and development in this area for many years to come.

3. Smart Contracts in Public Procurement

The conditions of an agreement between buyers and providers are directly inscribed into the lines of code used to execute smart contracts, which are self-executing computer programmes. The contract then executes automatically once all criteria have been met. By using block chain technology, these contracts are decentralised and tamper-proof.

Public procurement is the process of purchasing goods, services, or works on behalf of a government or a public institution. In public procurement, smart contracts can streamline the bidding and contract management process by reducing manual errors and improving transparency. Smart procurement contracts can be used to govern the entire procurement process, from the initial bidding stage to the final delivery of goods or services. They can be programmed to self-execute the terms of a contract, including the delivery of goods, payment, and dispute resolution. Smart contracts can also be designed to monitor performance, ensuring compliance with agreed standards, and minimising the risk of fraud and corruption. They are becoming increasingly popular in public procurement due to their ability to simplify the process, increase transparency, and reduce costs. They ensure that all parties involved in a procurement deal get the desired outcome without the need for intermediaries, which can result in delays, errors, and increased costs. Smart contracts in public procurement are specially designed to deal with the complexities of purchasing goods, services, or works in the public sector.

One of the most significant advantages of using smart contracts in public procurement is increased transparency. Smart contracts can be designed to capture all the relevant data and information related to the procurement process and record this information on a block chain. This information can be accessed by all stakeholders in real time, increasing transparency and accountability. This feature is particularly critical in public procurement, where there is a need for transparency, openness, and accountability.

Another advantage of smart contracts in public procurement is the potential to reduce costs. By eliminating intermediaries involved in the procurement process, smart contracts can help to save money, reduce the time to procure goods or services and eliminate errors.

3.1 Case Study: Successful Implementation in Indian Cities

Some cities have successfully implemented smart contract solutions for their procurement system including Pune City Municipal Corporation (PCMC). They began utilising a block chain-based e-tendering platform that enabled bidders to submit proposals online without paper documentation while recording all data on a distributed ledger reducing instances of fraud during the bids submission process.

India has already adopted Block chain technology into several sectors, such as supply chain management, where it has seen widespread success due mainly to transparency benefits derived from auditing capabilities provided by distributed ledger technologies (DLT). However specific case studies exist yet on implementation successes utilising smart contracts within Indian bureaucracy at scale but small-scale trials have shown great promise thus far indicating future wide-scale adoption appears inevitable given current trends towards more digitisation across society generally speaking over time so familiarity with digital innovations continues growing stronger every day here too!

4. Pros of Using Smart Contracts in India

The adoption of smart contracts in public procurement processes offers several benefits for both buyers and sellers. For buyers, using block chain technology to manage procurement processes can provide a transparent, secure, and efficient system for sourcing goods and services.

One significant advantage of using smart contracts is reduced costs. The automated nature of these contracts means that there is no need for intermediaries such as lawyers or brokers who charge fees for their services. Additionally, automation reduces the need for manual labour required to track down agreements or negotiate changes.

Smart contracts also help reduce fraud risks significantly by providing a tamper-proof record of all transaction data on an immutable block chain ledger accessible only by authorised parties.

There are several advantages to using smart contracts in public procurement systems in India:

1. Transparency - Smart contracts promote transparency by providing a permanent record of all transactions on a block chain ledger which creates an open platform for all stakeholders.

2. Improved Efficiency and Productivity – Since smart contracts automate processes traditionally done manually, they eliminate bureaucratic delays resulting from manual processing. These contracts are self-executing and can automatically trigger transactions once predetermined conditions have been met. This increased efficiency can lead to increased productivity, leading to more business opportunities in the local and international markets. In India, the use of smart contracts has become increasingly popular over the years.

3. Cost Savings - Automating processes reduce administrative expenses such as staff costs which can translate into cost savings for both buyers and suppliers. It eliminates the need for intermediaries such as lawyers and brokers, who charge exorbitant fees. These contracts can be executed almost instantly, without the need for tedious paperwork, saving time and effort for all parties involved.

4. Reduction of Fraud and corruption – Automated processes reduce opportunities for fraudulent activities through enhanced security measures. India has struggled with corruption in various sectors, but smart contracts can reduce the level of corruption significantly. Smart contracts are executed automatically without the need for human intervention, ensuring transparency and fairness in any business agreement.

5. Increased Security – These contracts in India can also provide more security

than traditional contracts. The immutable nature of the block chain technology, which is used to implement smart contracts, ensures that tampering and fraud are virtually impossible. By using smart contracts, all parties involved in a business agreement can be confident of the security and authenticity of the transaction.

6. Elimination of errors, disputes and litigation - Traditional contracts are often ambiguous, leading to disagreement and litigation. With smart contracts, the terms and conditions are set in code, and there is no room for interpretation or misinterpretation. This helps to save time and reduce costs for all parties involved in a commercial agreement.

7. Direct Measures to Promote Procurement - Smart Contracts can be an effective solution to streamline the public procurement process in India. Smart contracts are self-executing agreements that use block chain technology to execute transactions automatically once certain conditions are met. For instance, smart contracts can ensure timely payment to suppliers by automating invoice processing and payment release upon delivery of goods or services.

8. Indirect Measures to Promote Procurement - Apart from smart contracts, there are several other indirect measures that can facilitate procurement. A few examples include introducing credit guarantee schemes specifically for MSMEs that participate in government procurement; providing training programs on how to bid for government contracts; and establishing a dedicated help desk for MSMEs to address their queries regarding bidding procedures.

5. Cons of Using Smart Contracts in India

Smart Contracts are one of the most revolutionary technologies in the digital world. It represents the future of contract execution by automating and ensuring the accuracy and transparency of contracts. Smart contracts have been hailed as a life-changing technology that could revolutionise various industries. However, in India, the use of smart contracts is still in its nascent phase, and there are several cons associated with it.

Despite their apparent benefits, smart contracts present some challenges when implemented in public procurement systems. One significant concern is security vulnerabilities arising from coding errors or malicious attacks on connected nodes or devices.

1. Technical Expertise Requirements – Because smart contract technology relies heavily on coding skills; procurement teams must possess adequate technical expertise or hire experienced developers. The complicated technical architecture of these contracts requires a high degree of technical skills to use. This requires an understanding of block chain, cryptography, and programming languages like Solidity or Vyper. This complexity places a significant barrier to entry, making smart contracts only accessible to a few technical experts. This lack of expertise can result in a low adoption rate, particularly among small businesses and entrepreneurs.

2. Interoperability- Different systems may not be compatible with each other leading to delays or disputes during execution.

3. High Initial Costs - Investing in block chain infrastructure required for implementing smart contract solutions carries substantial financial commitment that may deter many organisations from exploring it.

4. Potential Legal Issues – Current legal frameworks vary concerning acceptance and recognition for smart contracted-based agreements, hindering widespread adoption. There is a lack of legal and regulatory clarity on using smart contracts in India. The Indian legal system has yet to catch up with technological advancements, and there are no clear laws that govern smart contracts' usage. The regulatory framework also plays a crucial role in promoting fair play among bidders participating in public procurement processes. It is important to have clear guidelines on bidder eligibility criteria; mandatory disclosure of financial information such as turnover and net worth; publishing all tender-related information online.

Smart contracts have gained a lot of attention in recent years, as they provide a secure and efficient way to exchange money, property or other assets without involving intermediaries. In India, the government and regulatory bodies have recognised the potential of smart contracts and are working towards establishing regulatory and legal provisions to ensure their legality and enforceability.

The Indian Contract Act, 1872 governs the formation and validity of traditional contracts, and its provisions also apply to smart contracts. The Act defines enforceable contracts as those that involve mutual consent, lawful consideration, and a lawful object. Smart contracts, which are self-executing and self-enforcing, meet these criteria, making them legally binding in India.

In addition to the Indian Contract Act, the Information Technology Act, 2000 (IT Act) also plays an important role in regulating smart contracts. The IT Act provides legal recognition to electronic records, electronic signatures, and digital contracts. It also establishes the legal framework for the use of electronic documents in court proceedings, making smart contracts enforceable in a court of law.

The Reserve Bank of India (RBI), the country's central bank, has also recognised the potential of smart contracts and has released guidelines on the use of block chain technology in the financial sector. These guidelines acknowledge the use of smart contracts in various financial transactions, such as trade finance and insurance, and outline the regulatory requirements for businesses using these technologies.

Another important regulatory body in India is the Securities and Exchange Board of India (SEBI), which oversees the securities market in the country. In 2018, SEBI released a discussion paper on the use of block chain technology in the securities market, which includes the use of smart contracts. The paper highlights the benefits of using smart contracts in the securities industry, such as automation of various processes, reduction of transaction costs, and increased transparency. It also suggests regulatory requirements that need to be met by businesses using smart contracts in securities transactions.

5. Susceptible to hacks and cyber-attacks - Since smart contracts operate as self-executing programs, any bug in the code can result in significant losses. If a smart contract is hacked, the losses can be catastrophic since they involve large sums of money. Additionally, there is no insurance protection available to cover losses incurred through smart contracts, making them high-risk contracts.

6. Lack of flexibility - Smart contracts are pre-programmed and cannot adapt to different circumstances, which makes them rigid. The pre-defined rules cannot accommodate any unforeseen changes, leading to delays and cost overruns.

7. Loss of jobs - Smart contracts automate many aspects of the contracting process, reducing the need for intermediaries. Thus, there is a possibility of job losses in sectors such as banking, legal, and real estate.

8. Audit in Procurement - Before implementing smart contracts, it is essential to conduct a thorough audit of the existing procurement process to identify areas that can benefit from automation. This audit helps to ensure that all requirements are clear and well-defined within the contract language. However, even the well-written code can contain vulnerabilities, which can lead to unexpected results, and that's where a smart contract audit comes in.

   A smart contract audit is a review process that involves thoroughly examining the code of a smart contract to identify any weaknesses or inconsistencies in its design, development, or implementation that may lead to unintended consequences. The audit aims to identify and mitigate bugs, loopholes, and vulnerabilities, to ensure that the smart contract behaves as intended and operates securely.

   To carry out a smart contract audit, the auditor must first analyse the code of the smart contract to identify any risks and issues. The auditor will examine the code line by line, looking for any discrepancies or logical flaws that could be exploited by bad actors, which could result in a loss of funds.

   Next, the auditor will evaluate the overall design of the smart contract, paying close attention to its functionality and user flow. The evaluator will look for areas where the smart contract could be improved to better meet the needs of the users and the objectives of the business.

   In addition, the auditors will assess the implementation of the smart contract, verifying that it works as planned and that it has been coded according to industry-standard best practices. They will also investigate the surrounding ecosystem and look for any external threats that could present risks to the smart contract.

   The results of the audit will then be documented in a detailed report, which will highlight the auditor's findings, the associated risks, and provide recommendations for improving the contract's design, implementation, and security.

6. Implementation Strategies for Smart Contracts In India's Public Procurement

The use of block chain technology in procurement has been gaining a lot of attention lately, with smart contracts being a crucial component of this evolution. Smart contracts are self-executing contracts that can automate processes and execute terms without the need for intermediaries.

However, implementing smart contracts in procurement can be challenging, especially for organisations that have traditionally relied on manual processes. Here are some strategies that can help organisations transition to smart contracts in procurement.

1. Define the rules and requirements - Before implementing smart contracts, it is essential to define the rules and requirements that the contract will enforce. This can be done by creating a contract framework that outlines the different conditions and scenarios that the contract will encounter. This framework should also identify the triggers that will initiate contract execution.

2. Identify the contract parties - Like traditional contracts, smart contracts require parties to agree on the terms of the contract. In procurement, these parties can include the buyer, seller, and any third-party intermediaries, such as logistics providers or payment processors. Identifying the parties involved in the contract will help in defining the roles and responsibilities in the procurement process.

3. Choose the right blockchain platform - There are many blockchain platforms available that support smart contract execution. Understanding the differences between these platforms and choosing the right one that meets the needs of the procurement process is crucial. Some factors to consider when choosing a blockchain platform include scalability, security, and ease of use.

4. Test and validate the contract - Before deploying the contract, it is essential to test and validate it to ensure that it meets the requirements defined in the contract framework. Testing the contract can involve simulating scenarios and checking whether the contract executes as expected. This process can help identify bugs and issues that can be resolved before deploying the contract.

5. Deploy and monitor the contract - Once the contract has been tested and validated, it can be deployed in a live environment. Monitoring the contract as it executes can help detect any issues or errors that may occur. This can be done using real-time analytics and reporting tools that provide visibility into the contract's performance.

Several approaches can be taken while implementing smart contracts into India's public procurement system:

- Firstly, collaboration with key stakeholders such as government agencies can provide valuable insights into how best practices should be incorporated into existing systems based on feedback gathered during consultations with industry leaders.

- Secondly, procuring new technologies may require additional investment upfront but could lead to long-term savings through reduced manual workloads and increased efficiency levels achieved through automation tools offered by Block chain-based platforms like Ethereum or Hyperledger Fabric among others.

7. Implementation Challenges Adopting Smart Contracts for Public Procurement

Implementing any new technology always presents challenges related to legacy systems integration issues; however, steps can be taken during pre-implementation stages such as thorough testing procedures using sandbox environments before going live on production servers where risks must be minimised whenever possible.

Smart contracts are digital protocols that enable the automated execution of contractual agreements. These contracts operate as self-executing codes that automatically trigger specific actions when pre-defined conditions are met. The use of smart contracts in procurement can prove to be highly beneficial, eliminating the need for intermediaries and reducing transaction processing times. However, the implementation of smart contracts in procurement brings along several challenges that need to be addressed before the full potential of this technology can be realised. Here are some of the major implementation challenges for smart contracts in procurement:

1. Technological complexity - Smart contracts are software programs that require technical expertise to develop and deploy. Procurement professionals may lack the technical knowledge

required to understand and develop smart contracts. Therefore, training or hiring personnel with the required technical skills is essential to ensure the successful implementation of smart contracts in procurement.

2. Legal clarity - While smart contracts have the potential to automate several aspects of procurement, there are legal implications that need to be addressed. Smart contracts are self-executing, making it crucial to ensure that the terms and conditions outlined in the contract are legally enforceable. This requires lawyers to be involved in the development and verification of smart contracts, leading to added expenses and time.

3. Interoperability - Even though Smart Contracts are a relatively new technology, there are already several competing platforms available. The lack of inter platform operability makes it difficult to integrate smart contracts with existing procurement systems. This creates a need for standardisation to ensure that different systems can interoperate seamlessly.

4. Data privacy - Smart contracts operate on a block chain, which, by design, records every transaction or data modification. While the block chain offers a tamper-proof platform, the use of smart contracts can create data privacy concerns. Organisations need to ensure that the data they share with smart contracts cannot be accessed by unauthorised parties.

5. Vendor lock-in - The use of smart contracts requires organisations to work with specific vendors that provide the required software and tools. This can create vendor lock-in, making it difficult for organisations to switch to a different vendor in the future. Therefore, it's important to choose vendors that offer highly customisable solutions to avoid getting locked-in.

8. Future Trends and Opportunities for Smart Contract Adoption in Indian Public Procurement

Smart contracts represent a revolutionary technology providing incredible opportunities for various industries. The future is sure to witness a rapid increase in the adoption of smart contracts, which will transform traditional business processes, enable transparency, and enhance security. The following will explore the future trends and opportunities for smart contract adoption in various sectors.

One of the significant areas where smart contract adoption will gain momentum is the supply chain industry. Smart contracts will enhance the transparency and security of supply chains while streamlining operations. By integrating sensors and data for automatic contract execution, large players in the supply chain industry can save time and enhance efficiency.

The real estate industry stands to benefit significantly from smart contract adoption in the future. Smart contracts will enable buyers and sellers to enter into automated agreements at a lower cost compared to traditional contracts. Additionally, smart contracts will enable real estate companies to reduce costs and time by automating compliance procedures.

The healthcare industry is also expected to keenly embrace smart contract technology. Healthcare companies can leverage smart contracts to reduce costs, enhance transparency, and automate compliance procedures. Additionally, smart contract adoption will also support clinical trials by ensuring that procedures are conducted in accordance with ethical standards.

Smart contracts will also bring innovation to the financial sector. For instance, smart contracts will revolutionise how people engage in activities such as online shopping and trading by making financial transactions faster, more secure, and cheaper. Furthermore, smart contracts may also reduce fraud, given their ability to provide immutable records that cannot be tampered with.

The gaming industry is also poised to benefit significantly from smart contract adoption. Smart contracts will enable gaming providers to create decentralised applications (DApps) with in-built smart contracts for secure and transparent gaming experiences. Additionally, smart contract adoption will also eliminate the need for intermediaries such as payment providers, allowing players to retain more value.

As more organisations start embracing DLTs like Ethereum and Hyperledger Fabric among others? We anticipate greater levels of use cases developing over time where governments leverage these technologies further optimising factors like cost reduction due to less human error potentialities encountered when traditional methods are used instead of having complete trustworthiness made possible via programmable codes put in place prior to any transactions occurring whatsoever – allowing those involved confidence transacting without fear being duped - something becoming increasingly relevant amidst growing calls accountability responsible behaviour when dealing matters involving government especially seen world-stage events exposing corrupt practices global institutions (e.g., FIFA scandal).

9. Conclusion

Smart contracting technology offers immense potential as far as improving transparency and efficiency while reducing cost opportunities within procurement systems. However, its deployment requires careful considerations and due diligence around legal interoperability issues, together with the appropriate technical expertise needed during operationalization stages and significant investment cost commitments expected from uninitiated investors. This will require stakeholder collaboration aimed at developing sustainable solutions, guaranteeing progress toward realising its full potential, and ultimately gaining better value for taxpayer money spent within government procuring procedures.

A Systematic Review of Sustainability Assessment Instruments: Examining the Sustainability Accounting Standards Board (SASB) and the Global Reporting Initiative (GRI)

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ABSTRACT

This research paper reviews sustainability assessment tools, specifically the Global Reporting Initiative (GRI) and the Sustainability Accounting Standards Board (SASB). It examines their evolution, effectiveness, challenges, and anticipated developments, providing practical implications for businesses, investors, and policymakers. The study aims to provide a comprehensive understanding of these frameworks. The first step of the study is to examine the background information and guiding principles of SASB and GRI. Challenges and barriers to the adoption of GRI and SASB are systematically identified, addressing resource intensiveness, complexity, and industry-specific nuances. The research evaluates the effectiveness of these frameworks in driving sustainability practices, emphasising their impact on decision-making, risk management, and stakeholder relations. The paper then highlights their integration with emerging standards, enhancements in materiality guidance, and the expansion of industry-specific standards. Emerging trends in sustainability assessment tools beyond GRI and SASB are also outlined, such as the integration of environmental, social and governance (ESG factors with financial metrics, a focus on climate-related disclosures, and technological advancements in data analytics.

Keywords: Sustainability assessment tools, Global Reporting Initiative (GRI), Sustainability Accounting Standards Board (SASB), evolution, challenges, effectiveness, anticipated evolution, emerging trends, implications, recommendations.

JEL Classification:

1.Introduction

Sustainability assessment tools are critical instruments designed to evaluate and measure an organisation's environmental, social, and economic impact. The increasing awareness of the interconnectedness between business operations and broader societal and environmental concerns has led to a

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growing demand for transparent and standardised reporting (Eccles & Krzus, 2010). Over the past few decades, there has been a noticeable shift in corporate reporting practices, with a greater emphasis on sustainability. This shift is explained by the growing understanding that companies have a big part to play in solving global issues including resource depletion, social injustice, and climate change (Moneva et al., 2007). The proliferation of sustainability reporting led to a heterogeneous landscape, with organisations using different methodologies and metrics, making it challenging to compare and assess their sustainability performance (Patten, 2002). This challenge underscored the necessity for standardised frameworks, prompting the establishment of organisations like GRI and SASB.

The inconsistency in sustainability reporting led to the creation of the Global Reporting Initiative (GRI) in the late 1990s. The goal of GRI is to provide universally recognised sustainability reporting standards that give businesses a framework for openly disclosing their effects on the economy, the environment, and society (GRI, 2021). GRI's criteria, which offer a thorough framework for reporting economic, environmental, and social performance, have evolved into the de facto norm for organisations worldwide (GRI, 2021). Businesses may better engage with stakeholders and show their commitment to sustainable operations by implementing GRI standards. GRI reporting allows businesses to address a wider range of material concerns and interact with stakeholders more successfully, which has been linked to improved environmental, social, and governance (ESG) performance, according to research (Cho et al., 2015; Krini, 2019).

On the other hand, the establishment of the Sustainability Accounting Standards Board (SASB) in 2011 was prompted by the demand for sector-specific sustainability guidelines. Unlike GRI, SASB focuses on developing industry-specific metrics that are material to investors for making informed decisions (SASB 2021). For investors looking for sector-specific data to determine how important sustainability concerns are to a certain company, the Sustainability Accounting Standards Board (SASB) is very helpful. SASB standards are designed to be financially material, helping investors make informed decisions by integrating financially relevant sustainability information into their analyses (SASB, 2021). Research indicates that SASB adoption is associated with improved financial performance, suggesting that companies focusing on material sustainability issues identified by SASB can create long-term value for investors (Amel-Zadeh & Serafeim, 2018; Grewal et al., 2021).

The combined use of GRI and SASB can provide a holistic approach to sustainability reporting. GRI's broad framework ensures comprehensive coverage of sustainability issues, while SASB's industry specificity enhances the relevance of reported information for investors. This combination helps businesses meet the varied expectations of many stakeholders, such as consumers, investors, and the general public.

Accordingly, this research paper's main goal is to provide a thorough evaluation and comparative analysis of the sustainability assessment tools offered by the Sustainability Accounting Standards Board (SASB) and the Global Reporting Initiative (GRI).

2. Literature Review

Overview of Tools for Sustainability Assessment

Tools for assessing sustainability are essential for assessing and quantifying the environmental, social, and economic effects of an organisation. Numerous tools have been discussed in the literature, each with its unique focus and approach. For instance, the Carbon Disclosure Project (CDP) is frequently cited for its emphasis on carbon-related disclosures (Tate et al., 2013). A comparison study that takes into account elements like reporting scope, metrics, and industry applicability might determine how GRI's holistic approach differs or complements the CDP's specific focus (Tate et al., 2013). The Dow Jones

Sustainability Index (DJSI) is known for its role in benchmarking the sustainability performance of companies (Eccles et al., 2011). In order to better understand the consequences for investors looking for industry-specific insights, a comparative study may examine how SASB's sector-specific requirements compare to or deviate from DJSI's wider criteria (Eccles et al., 2011). Several studies have undertaken comparative analyses of different sustainability assessment tools. These analyses assess the strengths, weaknesses, and unique features of each tool, contributing to a nuanced understanding of their applicability in diverse organisational contexts (Dyllick & Muff, 2016). While GRI and SASB are prominent in the literature, other frameworks and standards are also noteworthy. The International Integrated Reporting Council (IIRC) created the Integrated Reporting Framework, which is renowned for emphasising the integration of financial and non-financial data (Adams et al., 2016). The literature also charts the development of sustainability assessment instruments, documenting modifications to measurements, reporting standards, and methodology. This evolutionary viewpoint puts tool development and alignment with new sustainability concerns in context (Schaltegger & Burritt, 2018).

Evolution and development of GRI and SASB

The Global Reporting Initiative (GRI) has undergone a significant evolution since its establishment in the late 1990s. GRI originated as a collaborative effort between the Coalition for Environmentally Responsible Economies (CERES) and the United Nations Environment Programme (UNEP) to develop a framework for sustainability reporting (Moneva et al., 2007).

The first version of the GRI guidelines, known as the G1 Guidelines, was introduced in 1999. Since then, GRI has continuously updated and refined its guidelines to reflect changes in societal expectations, emerging sustainability issues, and advancements in reporting practices (GRI 2021). Notable milestones include the release of the G3 Guidelines in 2006, which marked a transition to a more modular and principles-based approach, and the subsequent G4 Guidelines in 2013, emphasising materiality and stakeholder engagement (IIRC, 2013).

On a comparative basis, GRI's sustainability rules include a range of topics, whereas the IIRC's Integrated Reporting Framework aims to combine financial and non-financial data. Given the incorporation of sustainability into larger organisational reporting, a comparison study might examine how much the IIRC framework and GRI complement or overlap with one another (Adams et al., 2016).

The first set of provisional SASB standards came in 2012, covering nine industries. SASB continued to refine and expand its standards, incorporating feedback from stakeholders through public consultation processes. The issuance of the codified standards in 2018 represented a significant milestone, providing a comprehensive set of guidelines for companies across various sectors (SASB, 2021). While SASB has made significant strides, challenges exist in achieving widespread adoption. Some industries and companies may still be in the early stages of incorporating SASB standards into their reporting practices. Examining the factors influencing adoption rates and addressing barriers is crucial for SASB's continued impact (Serafeim et al., 2020).

GRI's broader approach encompasses economic, environmental, and social aspects, while SASB focuses on industry-specific materiality to enhance financial decision-making (Adams et al., 2016).

3. Methodology

Adam et al (2016) say that one should evaluate the effectiveness of GRI and SASB in prioritising and reporting on material sustainability issues. Materiality ensures

that reported information is relevant and significant to stakeholder. On the other hand, Cho et al (2015) have suggested to assess the extent to which GRI and SASB cover economic, environmental, and social dimensions of sustainability. They add that it will be worthwhile to consider how comprehensive the frameworks are, in addressing a wide range of material issues. Dyllick & Muff (2016) have focussed on examining the level of stakeholder engagement facilitated by GRI and SASB. Eccles et al (2011) have emphasised how well SASB standards align with the unique sustainability challenges and opportunities within various industries (Eccles et al., 2011). Adams et al (2016) say that one should determine if GRI and SASB are successful in integrating financial and non-financial data, if appropriate. This is in line with the International Integrated Reporting Council's proposed Integrated Reporting Framework (Adams et al., 2016).

This paper adopts the approach suggested by Cho et al (2015) and makes a comparative assessment of GRI and SASB.

4. Global Reporting Initiative (GRI)

4.1. Mission of GRI

The mission of GRI is to empower decision-makers everywhere, through sustainability reporting, to make decisions that contribute to a sustainable world. This mission underscores GRI's commitment to providing organisations with a comprehensive and standardised framework for reporting on their economic, environmental, and social impacts. By doing so, GRI aims to drive transparency, accountability, and sustainability practices across various sectors and industries. However, critics argue that GRI reporting can be complex and resource-intensive, especially for smaller organisations. The extensive set of indicators and guidelines may pose challenges for companies with limited resources (Dyllick & Muff, 2016). GRI relies on voluntary adoption, and there is no formal enforcement mechanism. Some argue that this voluntary nature may lead to variations in the quality and depth of sustainability reporting among different organisations (Moneva et al., 2007). GRI's broad framework may not sufficiently address industry-specific nuances. Critics contend that certain industries face unique sustainability challenges that may not be fully captured by a standardised reporting framework (Eccles et al., 2011).

4.2. Objectives of GRI

GRI's objectives align closely with its mission and include:

1. Standard Setting: GRI aims to continually develop and improve its sustainability reporting standards to ensure they remain relevant, comprehensive, and effective in addressing global challenges (Global Reporting Initiative, 2021).
2. Global Adoption: GRI seeks to encourage the widespread adoption of its reporting framework by organisations around the world, fostering a common language for sustainability reporting that enables comparability and benchmarking.
3. Stakeholder Engagement: GRI places a strong emphasis on stakeholder engagement, involving various groups such as businesses, investors, governments, and civil society organisations in the development and refinement of its reporting standards (Global Reporting Initiative, 2021).

5. Sustainability Accounting Standards Board (SASB)

1. Industry focus: A core principle of SASB is its focus on industry-specific materiality. SASB recognises that material sustainability issues vary across industries, and its standards are designed to identify and prioritise the issues most relevant to the financial performance of companies within each sector (SASB 2021). Each sector has its own set of standards that address the unique sustainability issues and metrics relevant to companies within that industry. Within each industry standard, SASB identifies and categorises material sustainability issues into distinct

categories. These issue categories align with relevant aspects of environmental, social, and governance (ESG) considerations specific to the industry. The aim is to provide a comprehensive and organised framework for reporting thus the industry-specific approach ensures targeted and pertinent disclosure requirements (SASB 2021). For each disclosure topic, SASB provides a set of metrics and key performance indicators (KPIs). These metrics are quantitative and qualitative measures that companies can use to assess and report their performance on the identified sustainability issues. Metrics provide a basis for consistency and comparability across companies.

2. Investor Focus: SASB's founding principles include a strong emphasis on meeting the information needs of investors. The standards aim to provide investors with decision-useful information on material environmental, social, and governance (ESG) factors to enable better-informed investment decisions (Sustainability Accounting Standards Board, 2021).

3. Market-Driven Approach: SASB's approach is market-driven, involving extensive engagement with companies, investors, and other stakeholders to develop and refine its standards. This principle ensures that the standards are responsive to the evolving needs and expectations of the market (Sustainability Accounting Standards Board, 2021).

4. Integration with Financial Reporting: SASB seeks to integrate sustainability disclosure seamlessly into companies' financial filings. This integration is intended to streamline reporting processes and enhance the usefulness of sustainability information for investors within the existing regulatory framework (Sustainability Accounting Standards Board, 2021).

5. Guidance on Implementation: SASB standards include guidance on the implementation of the disclosure requirements. This guidance assists companies in understanding how to collect, measure, and report the relevant data. It aims to facilitate a smooth and standardised reporting process for companies across different industries (SASB, 2021).

6. Positive Influences of SASB on Sustainability Disclosure:

a) Increased Standardisation: SASB has contributed to increased standardisation in sustainability disclosure. By providing industry-specific standards with clear metrics and disclosure topics, SASB has helped companies align their reporting with a common framework, enhancing comparability across industries.

b) Investor Relevance: SASB's focus on addressing the information needs of investors has led to the development of standards that are directly relevant to investment decision-making. Investors can now access consistent and comparable sustainability information that is material to financial performance, aiding in more informed investment choices.

c) Integration with Financial Reporting: SASB's emphasis on integrating sustainability disclosure into financial filings has encouraged companies to incorporate ESG factors seamlessly into their overall reporting. This integration enhances the visibility and importance of sustainability metrics in financial reporting, making them more accessible to a broader audience, including regulators and financial analysts.

6. Discussion

6.1 Key similarities and differences between GRI and SASB

Similarities between GRI and SASB:

1. Focus on Materiality: Both GRI and SASB emphasise the importance of materiality in sustainability reporting. They encourage organisations to identify and prioritise the most relevant sustainability issues based on their impact on the organisation and the interests of stakeholders.

2. Stakeholder Engagement: Both frameworks recognise the significance of stakeholder engagement. GRI involves stakeholders in the development of its guidelines, and SASB conducts extensive stakeholder consultations during the development and updating of its standards. This engagement ensures that reporting frameworks consider a diverse range of perspectives.

Differences between GRI and SASB:

1. Scope and Coverage: GRI has a broader scope, covering economic, environmental, and social dimensions with a focus on the triple bottom line. SASB, on the other hand, is more industry-specific, concentrating on financially material sustainability issues relevant to specific.

2. Metrics and KPIs: GRI provides general guidance and principles without prescribing specific metrics or key performance indicators (KPIs), allowing organisations flexibility in measurement and reporting. In contrast, SASB standards include industry-specific metrics and KPIs, providing a more prescriptive approach for standardised reporting within sectors.

3. Integration with Financial Reporting: SASB places a stronger emphasis on integrating sustainability disclosure with financial reporting. SASB standards are designed to be included in mainstream filings with the Securities and Exchange Commission (SEC), linking sustainability performance to financial performance. GRI allows for integration but does not have the same explicit focus on financial filings.

6.2 Comparative Assessment of the Strengths and Weaknesses of each Framework

Strengths of GRI:

1. Comprehensive Coverage:
   GRI's strength lies in its comprehensive approach, covering economic, environmental, and social aspects. This inclusivity allows organisations to provide stakeholders with a holistic view of their sustainability performance.

2. Flexibility and Adaptability:
   GRI provides a flexible framework, allowing organisations to adapt reporting to their specific contexts. The guidelines are not prescriptive, offering companies the freedom to define materiality and choose relevant indicators.

3. Global Recognition and Adoption:
   GRI is globally recognised and widely adopted. Its use across various industries and regions contributes to the establishment of a common language for sustainability reporting, promoting transparency and comparability.

Weaknesses of GRI:

1. Lack of Industry Specificity:
   GRI's broad scope may lead to a lack of industry specificity. Some critics argue that industry-specific nuances may not be adequately addressed, resulting in less tailored and relevant reporting for certain sectors (Cho et al., 2015).

2. Complexity and Reporting Burden:
   The comprehensive nature of GRI guidelines can lead to complexity and a significant reporting burden, especially for smaller organisations. This may hinder widespread adoption, particularly among

companies with limited resources (Dyllick & Muff, 2016).

Strengths of SASB:

1. Industry - Specific Materiality:
   SASB's strength lies in its industry-specific focus on financially material sustainability issues. This approach ensures that companies address issues directly related to their industry's financial performance, enhancing the relevance of sustainability disclosures (SASB, 2021).

2. Investor Relevance:
   SASB's standards are developed with a specific focus on meeting the information needs of investors. This ensures that the disclosed information is directly relevant to investment decision-making, facilitating better-informed choices.

3. Integration with Financial Reporting:
   SASB's emphasis on integrating sustainability disclosure with financial reporting enhances the visibility of sustainability metrics within mainstream financial filings. This integration can lead to increased awareness and consideration of sustainability factors by financial analysts and regulators.

Weaknesses of SASB:

1. Narrower Scope:
   SASB's industry-specific focus may be considered a weakness in situations where a broader perspective is desired. This narrow scope may limit the ability to capture the full range of sustainability issues that could be relevant to a company's stakeholders (Cho et al., 2015).

2. Potential for Overlooking Non-Financial Impacts:
   The financial materiality lens of SASB standards may lead to a potential oversight of non-financial impacts that could be socially or environmentally significant. Critics argue that a narrow financial focus might not capture the entirety of a company's sustainability performance (Dyllick & Muff, 2016).

7. Impact and Adoption

Examination of the global impact and adoption rates of GRI and SASB

GRI has made efforts to align its standards with other international reporting frameworks, such as the United Nations Sustainable Development Goals (SDGs) and the Task Force on Climate-related Financial Disclosures (TCFD). This alignment enhances the global relevance and applicability of GRI's guidelines. On the other hand, SASB is popular for its focus on providing decision-useful information to investors. The industry-specific materiality of SASB standards enhances their relevance for companies seeking to attract investment based on their sustainability. SASB's emphasis on integrating sustainability disclosure with financial reporting aligns with global trends. The standards are designed to be included in mainstream financial filings, ensuring that sustainability information is integrated into the broader financial narrative of companies.

8. Conclusion

While GRI and SASB have distinct origins and objectives, their paths have converged in the pursuit of comprehensive and standardised sustainability reporting. Both GRI and SASB have evolved over time to align with international standards and address emerging sustainability challenges. GRI emphasises transparency, stakeholder engagement, and continuous improvement, while SASB focuses on industry-specific materiality and integration with financial reporting.

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