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E-TRANSFORMATION AND INSTITUTIONAL ARRANGEMENTS IN PUBLIC PROCUREMENT: SUGGESTIONS TO TURKEY

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E-TRANSFORMATION AND INSTITUTIONAL ARRANGEMENTS IN PUBLIC PROCUREMENT: SUGGESTIONS TO TURKEY*

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Resumo

A contratação pública é essencial para o bem-estar dos países, visto ser crucial no âmbito das despesas públicas e representar uma parte considerável do PIB. Este estudo foca-se nas dificuldades experienciadas pela Turquia na implementação da contratação pública e nas recomendações para a sua resolução. Recorrendo à análise de dados qualitativos, foi utilizada uma amostragem estratificada para identificar as dificuldades experienciadas pela Turquia no âmbito das decisões do Conselho sobre Contratação Pública. Adicionalmente, analisou-se as críticas apresentadas, nos relatórios de progresso elaborados pela Comissão Europeia, ao procedimento de contratação pública na Turquia. Neste âmbito, debateram-se exemplos de boas práticas nos Estados-Membros da UE, especialmente a Diretiva 2014/24/UE. Além disso, através de uma revisão da literatura, analisou-se práticas consideradas relevantes utilizadas por diversos países. Particularmente, a adaptação das inovações ocorridas no âmbito da transformação digital da contratação à contratação pública é essencial para reduzir custos e aumentar a transparência e a confiança no processo de tomada de decisão. Além dos estudos sobre a transformação digital na UE neste domínio, analisaram-se outros exemplos, nomeadamente o da transformação digital da Coreia do Sul, que possui projetos exemplares e pioneiros. A transformação digital na contratação pública também contribuirá para a crítica da contratação pública turca nos Relatórios de Progresso da União Europeia, ao minimizar o erro humano nas tarefas administrativas. As soluções propostas visam contribuir para a eliminação dos problemas encontrados na contratação pública da Turquia.

Abstract

Public procurement is significant for countries' welfare as it is critical in public expenditures and a considerable share of GDP. This study focuses on the problems experienced in implementing public procurement in Turkey and recommendations for solving these problems. Using qualitative data analysis as a method, a stratified sampling method was used to identify the issues in Turkey within the framework of the decisions of the Public Procurement Board. In addition, the criticisms on public procurement in the progress reports prepared by the European Commission on Turkey were examined. Examples of good practices in EU member states, especially the EU Directive 2014/24/EU, were discussed in this context. In addition, some country practices that are considered to be important are analyzed through a literature review. Notably, adapting the innovations of e-procurement transformation to public procurement is essential for reducing costs, increasing transparency, and increasing confidence in the decision-making process. In addition to the EU e-transformation studies in this field, other examples have been analyzed, namely the example of South Korea's e-transformation, since it has exemplary projects and a pioneering role. E-transformation in public procurement will also contribute to the criticism of Turkey's public procurement in the European Union Progress Reports by minimizing human error in administrative tasks. The proposed solutions are aimed at contributing to the elimination of the problems encountered in public procurement in Turkey.

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Introduction

Public procurement is the purchase of goods and services, construction works, and leasing transactions to fulfill the state's public services. A correct policy on public procurement will encourage the provision of quality public services in the country while promoting financial efficiency. At the same time, it will also provide the necessary infrastructure for economic development. This is because public procurement plays a vital role in the price formation process when the market price for the purchase and sale is unavailable or uncertain. With the advent of Neoliberal policies after the Second World War, the state has evolved from producing goods and services to obtaining goods and services from the private sector, making public procurement an economic actor. In particular, procurement is conducted when permits (licenses) are granted to create markets in the infrastructure sectors such as spectrum sales, electricity, and telecommunications. On the other hand, public expenditures increase steadily worldwide and in Turkey, along with the shift in fiscal policies over time. The large volume of such purchases put public procurement's economic/financial and fiscal side under the spotlight. Public procurement has become an increasingly important area for economies and international trade. Public procurement has a crucial role in disciplining public expenditures, achieving fiscal balance and budget targets, planning and realizing investments, increasing regional development and employment, sectoral and product-based support, providing advantages to domestic goods and domestic enterprises, foreign trade deficit and balance of payments, taking measures and developing bilateral and multilateral trade with other countries. To sum up, public procurement is a strategic issue for all countries and Turkey. For this reason, the healthy functioning of the legislation regarding public procurement in Turkey is critical in carrying out an efficient, effective, and economic process. Due to this strategic importance of public procurement, countries, and international organizations aim to perfect public procurement procedures by conducting a series of studies. This research on public procurement in Turkey shows that the biggest obstacles to the effective functioning of public procurement in Turkey stem mainly from human-related problems rather than legislative problems. These problems cause violations of the basic principles of public procurement, such as ensuring transparency and accountability, equal competition and saving resources, reliability, confidentiality, public scrutiny, and meeting the needs on time and under favorable conditions (Article 5 of Law No. 4734). While e-transformation practices that will reduce errors caused by the human factor in solving these problems are particularly examined in this study, at the same time, Ombudsman and ADR (Alternative Dispute Resolution), which will increase communication between the parties and strengthen impartiality, are thought to make significant contributions to the quality of management, and various legal

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regulations that remind and protect the rights of the parties, which we believe will strengthen transparency and equal competition, and examples of training and rotation practices that increase the impartiality and quality of contracting officers in the administration are focused on.

Within electronic transformation studies in public procurement, basic studies such as moving tenders to e-platform, organizing tender documents electronically, and using artificial intelligence and blockchain technologies in tenders are carried out in countries. Especially as the use of e-transformation studies in public procurement increases, many human-related problems arising in practice can be prevented, and significant resource savings are also achieved (Pavel and Beblava, 2013). Beyond these studies, various legal norms are enacted to improve the perception of trust between the contracting authority and bidders, and alternative ways are developed to resolve disputes. Similarly, in Turkey, within the framework of the criticisms in the EU Turkey Reports, public procurement reform was carried out in the post-2002 period to harmonize with the EU public procurement directives, and EU-compliant legislation was established. Various electronic transformation reforms were made, and legal norms were developed. However, today, the criticisms in the EU Turkey Reports in areas such as corruption, favoritism, competition principle, accountability, and audit continue, and a series of problems are experienced in practice. This study it is aimed to identify the problems experienced in public procurement in Turkey within the framework of the decisions of the Public Procurement Authority, which is the regulatory and supervisory body of public procurement, and to provide suggestions for these problems with the results obtained from the literature reviews.

The research method of this study is based on text mining. The research method consists of forming the main mass by collecting the decisions of the Public Procurement Authority by random sampling method with a confidence interval of ninety-five percent. The data set was analyzed using NVivo 20 qualitative data analysis software. In this context, 406 samples of the appeal decisions given to the Public Procurement Authority were analyzed by stratified sampling method. In addition, taking into account the criticisms in the Turkey Report prepared by the European Commission every year for Turkey, which is in the EU membership process, examples of good country practices identified within the framework of the EU public procurement directive 2014/24/EU and the International Public Service Effectiveness (InCiSE) Index in 2019 are discussed in a multidimensional manner, and recommendations are made for Turkey.

1. PROBLEMS IN PUBLIC PROCUREMENT IN TURKEY

A reform was carried out in Turkey in 2002 regarding public procurement, in line with the criticisms and commitments made in the European Union Progress Reports, now known as Turkey Reports, within the European Union accession process framework. With these reforms, public procurement in Turkey gained a new perspective, revenue tenders were separated from expenditure tenders, and the Public Procurement Authority, with administrative and financial autonomy as the regulatory and supervisory body, was established. The fundamental law of expenditure tenders under the new regulation became the Public Procurement Law No. 4734. Although the justification for Law No. 4734 stated that it was prepared in compliance with the European Union Directive, the number

of applications for complaints to the Public Procurement Authority as a dispute resolution method continued to increase. To identify disputes arising in public procurement and to make recommendations, the decisions of the Public Procurement Authority were subjected to text mining analysis using the NVivo 20 software with a 95% confidence interval and the random sampling method. The main reason for examining the decisions of the Public Procurement Authority concerning the detection of disputes in public procurement in Turkey is due to the fact that the Public Procurement Authority is a regulatory and supervisory body with administrative and financial autonomy and is responsible for the correct implementation of the principles, procedures, and processes specified in the Public Procurement Law No. 4734. In addition, the fact that the route of application for the complaint to the Public Procurement Authority must be exhausted as a compulsory administrative route before the judicial stage for issues subject to dispute in tenders also became the main reason for preferring decisions of the Public Procurement Authority in terms of identifying the subject matter of the argument. With deductive content analysis as the research methodology, codes were structured depending on the research purpose. An analysis matrix was created by subjecting them to the research criteria (Kynge *et al.*, 1999). Within the framework of this matrix, word frequency queries, word clouds and word trees, and mind maps were analyzed. As a result of the study data analysis, the Coding Query Test was applied to measure the reliability of the matrices. Once a categorization matrix was developed, all data were reviewed for content fit or sampling with the identified categories. The manual coding method was used to create the analysis codes.

As a result of the analysis, when the distribution of the objections made by the bidders to the Public Procurement Authority is analyzed, the most disputed issue is the abnormally low tenders explained in Article 38 of Law No. 4734 with a rate of 22% in terms of coding rate. The relevant article stipulates that bidders whose bid price is meager compared to other bids or the approximate cost determined by the administration shall be identified and evaluated by requesting a written explanation from these bidders. Such a high rate of abnormally low tenders being subject to objectionable complaints indicates that the administration did not determine the approximate cost sufficiently by the market conditions or that the bidders did not trust the administration's decisions after the written explanations of the bidders who submitted abnormally low tenders. Abnormally low tenders are followed by applications against tenders, explained in Article 54 of the Law, with 20%. The provision on applications against tenders of the Law explains the form and procedural principles to be followed by the bidders in their appeals to the contracting authority or in their objection complaints to the Authority. These results show that many applications are rejected because the bidders do not submit an application per the procedures and principles to be followed in their applications for objection to the contracting authority or appeal to the Institution. These issues can be summarised as; incomplete writing of the issues that should be included in the complaint and objection petition, incomplete documents to be attached to the petition, an incomplete deposit of the security requested for the application, and other formal deficiencies. The specifications, which are the subject of the third most frequent complaint with 18% in terms of coding rate, are regulated in Article 12 of the Law. According to the relevant provision of the Law, specifications are prepared by the contracting authorities as technical and administrative specifications to specify all kinds of characteristics of the procurement of goods or services subject to the tender, or they are prepared by the contracting authorities when necessary. The preparation of technical specifications is a crucial document that affects the participation of bidders in the tender, which will ensure that the most advantageous tender offer is reached. In this context, the fact that the specifications are subject to a high dispute rate through objectionable complaints shows

that the prepared specifications are not compelling enough. Another critical issue subject to objection complaints concerns the qualification rules for participation in tenders with a coding rate of 18%. Article 10 of Law No.4734 stipulates the information and documents that may be requested in determining the economic and financial competence and professional and technical competence of the tenderers who will participate in the tenders and the issues that will cause the tenderers to be excluded from the tender. The coding regarding the qualification rules for participation in tenders indicates that bidders do not comply with the qualification rules for participation in tenders or have conflicts with the contracting authority. There are also disputes between the contracting administration and bidders regarding the exclusion of bidders.

Another issue with a rate of 11% in the disputes subject to objected complaints is Article 53 of the Law regulating the duties and responsibilities of the Public Procurement Authority. Article 53 of Law No. 4734 states that "to evaluate and conclude any complaints claiming that the proceedings carried out by contracting authority within the period from the commencement of the tender proceedings until the signing of the contract are in violation of 4734 Law and the related legislative provisions" (Article 53 of the Law No. 4734). The main reason for the prominence of this article is due to the objection complaints made by the tenderers regarding the cases where the Public Procurement Authority is not authorized. The most important of these are the applications regarding the disputes in the tenders made within the framework of other laws not subject to Law No. 4734, and secondly, the dispute applications regarding the fulfillment of contractual obligations after the completion of the tender process. As can be seen, both issues are outside the scope of the Public Procurement Authority's review. Complaint application to the contracting authority, with a coding rate of 10%, has a significant share in objectionable complaints. This issue, which is explained in Article 55 of the Law, explains the duration of the applications to be made by the tenderers to the contracting authority regarding the dispute, the obligation of the contracting authority to examine it, and the obligations of the parties during the appeal. In this context, the high number of codings related to the provision on filing a complaint to the contracting authority stems from the parties' incomplete fulfillment of their obligations regarding filing objections to the contracting authority. The number of objectionable complaint applications related to the evaluation of bids by the tender commission is also relatively high at 9%. The number of complaint applications associated with the evaluation of tenders by the tender commission is also relatively high at 9%. Article 37 of Law No. 4734 stipulates the duties and responsibilities of the tender commission in the evaluation of tenders. Apart from these codifications, it is seen that Article 30 of the Law, which is subtitled as preparation of the bids by the candidate and submission of the bids to the administration, is the subject of objection complaints with 5%. When this issue is evaluated, it can be said that the candidates, tenderers, or would-be tenderers did not act with sufficient diligence regarding the preparation of the tender letters, the documents required for technical evaluation, and the fulfillment of the formal elements related to the tender envelopes. In addition, the fact that a non-technical issue is the subject of an objection complaint at this rate may also be said that the tenderers do not consider the decisions of the tender commission and the contracting authority as safe and prefer to file an objection complaint with the Institution. On the other hand, Article 56, titled "The appeal application to the Public Procurement Authority," and Article 57, titled "Judicial review," which are subject to 3% of disputes, show that the tenderers do not pay enough attention to the formal elements, procedures, and principles in their dispute applications. Article 39, entitled "Rejection of all bids and cancellation of the tender," and Article 36, entitled "Receipt and opening of bids," which are subject to 3% of the appealed complaints, may lead to the

conclusion that there is insufficient communication between the administration and the bidders or that there is no trust relationship between the bidders and the administration, and that the decisions of the administration's appeal authority do not sufficiently convince the bidders. These assessments can be supported because 67% of the Public Procurement Authority's decisions on objection complaints are rejections.

When we examine the general distribution of the decisions of the Public Procurement Board, it is seen that rejection decisions come first, with 67%. Rejection decisions are decisions taken "in cases where the application does not comply with the time, procedure and form rules, the contract has been duly signed, or no violation of the law that would require the cancellation of the tender or determination of corrective action cannot be detected in the transactions subject to the complaint, or the matter subject to the objection complaint application is not within the jurisdiction of the Authority" (İYBHT, Article 15/1-c.). When the distribution within the rejection decisions is analyzed, it is seen that 69% of the decisions are that the bidder's claim is not appropriate, 17% of the decisions are rejected in terms of duration, 10% of the decisions are rejected in terms of form, 10% of the decisions are rejected in terms of form, 6% of the decisions are rejected in terms of duty, 4% of the decisions are rejected in terms of competence, 3% of the decisions are rejected in terms of duration and form, 3% of the decisions are dismissed in terms of procedure, 2% of the decisions are not appropriate to make a decision, and 1% of the decisions are appropriate to cancel the tender. When the rejection decisions are evaluated in general, it will be seen that the highest rate of 69% is the case where the bidder's claim (i.e., the tenderer) is not found to be relevant. This result will lead to the conclusion that there is insufficient trust between the bidders and the administration. Bidders first dispute with the tender commission at the objection complaint stage and then exhaust the mandatory appeal to the contracting authority. Considering the high number of rejection decisions in general, it is seen that the contracting authority conducted the procurement process by the legislation but was not sufficiently successful in convincing the tenderers that the procedures of the contracting authority complied with the legislation. Two conclusions can be drawn from this situation. The first is that bidders do not trust contracting authorities. It can also be said that there is a lack of communication between the contracting authority and the bidders. The second conclusion is that bidders do not have sufficient confidence in the contracting authority's appeal authority. It is seen that the bidders did not find the explanations at these stages acceptable and applied them to the objection complaint. When evaluated in terms of other reasons for rejection, it is concluded that the bidders failed to use the procedures and principles regarding the objected complaint application and did not comply with other applicable rules. After the rejection decision by the Public Procurement Authority, the highest coding rate was the corrective action decision, with 22%, followed by the cancellation decision, with 21%. A corrective action decision is a decision taken in cases where the disputed transaction subject to the objection complaint can be eliminated by a correction to be made by the administration. There is no need to interrupt the tender process (İYBHT, Article 15/1-b). In other words, corrective action decisions are essentially about simple corrections that do not directly affect the outcome of the tender and are not related to the merits of the tender. During the corrective action to be taken by the contracting authority in the tender, another candidate, tenderer, or potential tenderer will not lose their rights. In the event that unlawful issues that will prevent the continuation of the tender process and cannot be eliminated by corrective action are detected, a decision is made to cancel the tender. As can be seen, while a significant 22% of the issues that constitute the subject of the dispute consisted of simple transactions that can be eliminated by corrective actions, 21% of the disputes led to the cancellation of the tender because they were legal disputes that

would affect the merits. Another 1% of the Board's decisions consisted of approving the decisions regarding the objections made to the contracting authority, i.e., the justification of the tenderer who filed an objection complaint.

As a result, there are areas for improvement on the part of the contracting authority regarding abnormally low tenders, preparation of specifications, receiving and opening of tenders, and evaluation of tenders. On the bidders' side, it is observed that there are significant areas for improvement in the fulfillment of the procedures and principles and compliance with the formal requirements, especially in applying for tenders, fulfilling responsibilities, and applying to the appeal authorities regarding disputes. An important reason for the dispute is that the bidders have a significant lack of trust in the actions of the administration. An important reason for this inference is that although the majority of the decisions of the administration that are subject to objection are, in fact, correct, they are nevertheless subject to objection by the tenderers. It is also related to the fact that the majority of the decisions at the stage of objection to the administration before the stage of appeal to the Authority are subject to appeal. Similarly, the EU Turkey Reports emphasize the need for Turkey to continue its e-transformation efforts in public procurement while at the same time working on improving management capacity in public procurement and developing a risk indicator system, including integrity and conflict of interest rules, on identifying and take action against corrupt and fraudulent practices, avoid excessive use of the negotiation procedure which limits competition and transparency, amend the public procurement legislation to bring it more in line with the 2014 EU Directives and increase transparency, and avoid offset practices (Turkey Report, 2022; Turkey Report, 2021; Turkey Report, 2020). In this context, to put forward suggestions for the main problems subject to disputes identified in Turkey in the public procurement process, the applications of electronic applications, an essential tool of recent years, in public procurement, will be examined, as well as examples that will ensure the development of good governance in public procurement will be mentioned.

2. BEST PRACTICES AND REGULATIONS FOR IMPROVING THE PUBLIC PROCUREMENT PROCESS IN TURKEY

In this section, best country practices will be mentioned to seek solutions in line with the inferences obtained from the text mining analysis conducted to identify the problems experienced in the public procurement process in Turkey. As explained in the title above, since it is concluded that a significant portion of the disputes arising in public procurement in Turkey is caused by problems arising from practitioners rather than the lack of legislation, e-transformation practices that will set an example for Turkey in public procurement that in minimizing the human factor in practice will be mentioned first. In this context, e-transformation studies in public procurement in the European Union will be mentioned first since Turkey is a country in the process of membership to the European Union. Therefore, it has good practice examples and efforts to harmonize its public procurement legislation with the European Union public procurement legislation. In addition, regarding e-transformation in public procurement, the model of South Korea, one of the best country practices within the framework of the International Public

Effectiveness (InCiSE) Index of 2019 and is an example for many countries in the world, will be examined. On the other hand, examples of projects related to artificial intelligence, machine learning, big data and data analysis, Blockchain, and robotic processes that support innovation and sustainability, which are considered to make a significant contribution to e-transformation efforts, will be briefly examined. Under this heading, examples that contribute to resolving the issues that cause disputes and increase the quality of management will also be included. In this context, sample country practices related to good governance determined within the framework of the 2019 International Public Service Effectiveness (InCiSE) Index, which describes alternative methods for resolving disputes, includes legal regulations or rules and increases the quality of management and participation, will be explained.

2.1. Electronic Conversion Applications in Public Procurement

The primary condition for success in the realization of electronic transformation in the public procurement process is the willingness of governments to this transformation, the preparation of the policy and legal framework, institutional change, awareness and capacity building, and adaptation to modern technology (World Bank, 2003). With the electronic transformation process, it is also vital to incorporate new digital concepts into public procurement legislation, define their functions and make the legislative infrastructure suitable for transformation. In addition to legal and bureaucratic regulations, it is also essential that the suppliers in the country are ready for electronic transformation and have an electronic infrastructure (Dovgalenko, 2020). It is not enough for suppliers and administrations to have access to technological infrastructure; it will also be essential to inform civil servants and suppliers through training to adapt the system to the best practices for the business case and project management, to integrate the system with other institutions and private sector infrastructure, to prepare the security and authentication infrastructure, to restructure the process and to provide support, incentives and performance measurements to both institutions and suppliers (Vaidya et al., 2006). In addition to all these regulations, data will be used more efficiently to meet the goals of speed, flexibility, and innovation as Industry 4.0 is implemented with the more widespread use of data analytics and artificial intelligence in procurement by keeping pace with developing and changing technology (Baily et al., 2022).

Despite all efforts to transform public procurement, the transformation itself will only become operational if several risks are eliminated. According to the European Commission, the most important risks are fear and laziness on the part of contracting authorities and suppliers (costs of transformation, lack of information, perceived risks in the process of integrating information systems, etc.), risks arising from the lack of guidelines for managing the process in procurement processes (lack of access to information, being defrauded, etc.), costly technical requirements, in particular in the authentication of bidders (EC, 2010). In this context, unilateral efforts for greater transparency, however successful, will only sometimes eliminate corruption. Contracting authorities and suppliers also need to adapt to technological transformation in a mutually honest manner (Prier et al., 2018). The potential impact of a successful electronic procurement process has been estimated at least 12 percent savings in transaction costs related to procurement workflows. There is also clear evidence that e-procurement can increase competition in the market and thus reduce the prices paid by the government, resulting in cost savings of between 5 and 25 percent (Procurement

Harmonization Project of the Asian Development Bank, 2004). In the USA, savings of up to 20 percent of the initial value were achieved; in the United Kingdom, savings of more than 10 percent were observed; and in the European Union (Hanák, 2018), savings of less than 3 percent were achieved in Austria, while in Norway savings of between 2 and 10 percent were achieved (EC, 2010). I believe that savings rates will be higher in countries where the risk of corruption and corruption is higher, and bureaucracy is more intensive.

Electronic public procurement is the use of information and communication technology for the procurement of goods and services and works required by the state, including the pre-solicitation phase (identification and selection of suppliers of goods and services; supplier/product or service, ensuring compliance with procurement procedures, determining the most advantageous offer), preparation of the procurement request (requesting and procuring goods, services or works and approving the procurement; approval of delivery by the criteria in the pre-requisition stage, information integration between public institutions) and (invoicing and cross-checking, management of debts and payment process) completion of other post-procurement activities (World Bank, 2003; Yu and Mishra, 2015). Electronic public procurement includes many forms of public procurement such as e-informing, e-MRO (Procurement Of Maintenance, Repair, and Operating (ibid.), e-tendering, e-marketing, e-auction/reverse auction and e-catalog/purchasing, web-based ERP (Enterprise Resource Planning), and may also include other aspects of the public procurement process such as document management, e-intelligence, e-analysis, e-payment (e.g., e-invoicing, e-sourcing), contracting and information sharing (Baily et al., 2022). The status of electronic tenders in public procurement is analyzed under two headings. The first one is the policies being implemented in public procurement. The second one analyses the issues being worked on as a project and will be implemented or have just been implemented.

As seen in the analysis, the most critical problem that causes disputes in public procurement transactions in Turkey is that the parties to public procurement, namely contracting authorities and bidders, do not have sufficient experience in fulfilling the formalities, procedures, and principles. For this reason, while contracting authorities cause significant disputes regarding the examination of bids and the preparation of contracts, bidders, on the other hand, seem to have insufficient knowledge of the procedures and principles regarding the application for tenders, fulfillment of responsibilities, and application to the appeal authorities regarding disputes. There are significant deficiencies in compliance with the formal elements. In this context, I believe that the minimization of disputes arising from incomplete transactions, which is the basis of this disputed issue, will be resolved by minimizing the human factor in practice. The most critical factor in reducing errors arising from the human factor is the widespread and effective use of electronic transformation in public procurement. In addition, this transformation will significantly contribute to the frequent use of dispute remedies due to the lack of trust between the parties in tenders, which is thought to be the cause of the dispute that emerged in the analysis. Regarding the lack of confidence and incompatibility between the parties, the EU Turkey Reports emphasize the perception of corruption in public procurement, favoritism, insufficient supervision, and qualified personnel (Republic of Turkey Ministry of Foreign Affairs Directorate for EU Affairs, 2022). Electronic transformation in public procurement can be an essential tool in minimizing these problems. Furthermore, the development of e-tendering efforts is included as a recommendation in EU reports on Turkey (Turkey Report, 2021). In this context, under this heading, first of all, the EU electronic transformation in public procurement and the transformation in Turkey are analyzed comparatively, and conclusions are drawn for Turkey. On the other hand, innovation-oriented electronic transformation projects in the EU and some other sample countries are analyzed. Under this heading, due to Turkey's

efforts to become a member of the European Union and its commitments to approach the European Union practices in its progress reports, e-transformation practices in Turkey and the European Union will first be mentioned within the framework of Directive 2014/24/EU, and then South Korea, which is one of the most experienced and prosperous countries in e-transformation as described in the International Public Service Effectiveness (InCiSE) Index of 2019, will be mentioned as an exemplary model (Oxford University, 2019).

2.1.1. European Union

Directive 2014/24/EU Public Procurement Directive 2014/24/EU focuses on key aspects such as the electronic transmission of notifications, electronic availability of procurement documents, and electronic submission of requests for participation and tenders (The European Parliament and of the Council, 2014, L 94/65). Firstly, in the conduct of public procurement, the Tenders Electronic Daily (TED) platform has been implemented by the Publications Office of the European Union, which was launched in 2016, enabling companies to obtain information on public procurement opportunities in the EU, the European Economic Area and beyond through a single access point (EU, 2022a). The TED portal is also supported by the Information System for European Public Procurement (SIMAP) portal, which builds on TED (Tenders Electronic Daily) to provide information on European public procurement (EU, 2022b). TED forms the basis of European Union electronic public procurement, which can be used to the benefit of Member States and bidders from non-EU countries with which the EU has public procurement commitments through international agreements (such as the WTO multilateral Government Procurement Agreement or bilateral FTA agreements). This means that tender notices are published electronically on the Tenders Electronic Daily (TED), and procurement documents can be accessed electronically via TED. Contracting authorities can accept tenders electronically, and tenderers can submit tenders electronically (EC, 2016). Invoicing as a means of payment is also part of the electronic environment. The SOLVIT portal can also be used to avoid unfair rules or decisions within the system for EU citizens and suppliers, discriminatory bureaucracy, and practices that make it difficult for them to work or do business in another EU country (EC, 2022a).

The new Public Procurement Directives pave the way for the digitalization of public procurement. In line with the single market strategy objective, new regulations have been made in public procurement with the new Directive, and transactions related to the tender process have moved more and more to the electronic environment. One of the most important of these arrangements is the introduction of e-invoicing in 2014. (The European Parliament and the Council of the European Union, 2014, L 133/1). The directive was published, and it was decided that the invoices to be issued due to the performance of contracts in public procurement shall be implemented as e-invoices. Another regulation is the European Single Procurement Document (ESPD) published in 2016, which serves as a business passport that enables businesses to self-declare their financial status, capabilities, and eligibility for a public procurement procedure (e.g., have they fulfilled their tax obligations?, do they have sufficient financial status?, do they have the necessary expertise documents?), and as of 18 April 2018, when e-Procurement became mandatory, public procurement started to be provided electronically and made available through an electronic application in each Member State. The ESPD will allow the reuse of data filled in by businesses in previous procurement procedures. It is also the entry point for the digitalization of the qualification phase of public procurement. The eCertis application, adopted in 2016, is an information system used to identify the different certificates

required in public procurement procedures across the EU (EC, 2022b). Certis also helps them to understand the documents used to prove that exclusion or selection criteria are met, such as criminal record and good financial standing.

The “Once-Only Principle (TOOP)”, which is very important for European public procurement and enables suppliers to avoid duplication and bureaucracy in the provision of documents, proposes that each document should be provided to public authorities only once. The TOOP aims to ensure a better exchange of business-related data or documents between public authorities and tenderers and to reduce the administrative burden on businesses and public authorities (EC, 2022c). This is intended to enable companies to devote the time saved to providing documents to their core business (EC, 2016). Public contracting authorities in the EU have started using the Internal Market Information System (IMI) since 2015 to enable them to verify the information and documents they receive from companies in other EU countries (EU, 2022c). In 2017, e-Invoicing was announced to cover only centralized procurement units, with end-to-end electronic transfer of invoices between business partners, while e-Invoicing (EC, 2022d) standards were published in the same year. In 2020, sub-contracting authorities were also included in e-Invoicing (Directive 2014/55/EU). In 2018, the e-Application method (EC, 2022e) was announced to facilitate the submission of regulatory information to the National Competent Authorities and EMA regarding marketing authorization applications for medicinal products and to streamline the business process. In 2019, the e-Forms implementing regulation was published, which establishes the standard forms used by public buyers to publish purchase announcements in the Tenders Electronic Daily (TED), while e-Forms will be available on an optional basis as of the 11th month of 2022. The use of e-Forms will be mandatory as of the 10th month of 2023.

In addition to the projects undertaken at the national, regional, or local level regarding electronic transformation in public procurement in the European Union, various projects continue to be carried out between EU countries. First, these projects are supported by the Connecting Europe Facility (CEF) European financing instrument. Due to the increasing importance of data standards in the e-procurement process, the EU e-Procurement Ontology (ePO) project was initiated by the EU Publications Office (EC, 2022f). Due to various studies in the literature and different approaches in the public sector and the market, differences have emerged in terms of dictionaries, meanings, public procurement stages, and the technologies they use regarding data standards. Since these differences prevented easy and synchronized access to data from different sources, a common data standard has been established. The availability of this data by contracting authorities and suppliers has been ensured, both in terms of potential bidders, accountability in society, and harmonized reusability of data by contracting authorities (EC, 2022g). Another study on public procurement is the Digital Whistle-blower Project (DIGIWHIST). This project aims to facilitate feedback to citizens within the framework of accountability and transparency regarding public procurement expenditures by assessing the impact of financial transparency, risk assessment, and good governance policies (EC, 2022h). The project includes the EuroPEM study on European accountability mechanisms, the open tender study to make public procurement more transparent, and the Monitoring European Tenders (MET) study as a risk assessment system. “They Buy For You”, a project funded by the Horizon 2020 project[1], aims to enrich public procurement data by

[1] Horizon 2020 was the EU's research and innovation funding program with a budget of approximately €80 billion between 2014 and 2020. This program was replaced by Horizon Europe. Horizon Europe is the European Union's Framework Programme for research and innovation funding for the period 2021-2027. The budget of the program is 80 billion Euros. For detailed information, see Universida de Lisboa (2020), "Horizon 2020", <https://www.ulisboa.pt/info/horizon-2020>, (04.10.2022); Horizon Europe 2021- 2027 is the new Framework Programme with a total budget of €95.5 billion. Currently, the draft calls for subsidies are still under consultation. For detailed information see; Europe Commission, *The EU Research & Innovation Programme 2021 -27*, Research and Innovation, 2021.

integrating it with data from other open sources and analyzing the latest data science methods to provide information on the opportunities and challenges faced by stakeholders in a wide range of procurement business scenarios (European Union's Horizon 2020, 2020).

The e-SENS (Electronic Simple European Network Services) project, launched by the European Commission in 2013 and ended on 31 March 2017, aims to strengthen the EU digital single market and facilitate public services across borders. It aimed to develop the European digital market through innovative information and communication technology tools. Within the scope of this project, digital public services have been prepared that embrace both national and sectoral organizational diversity, cooperation, and integration. They are intended to strengthen the EU digital single market and facilitate public services across borders. For example, integration was achieved by extending the building blocks of e-Delivery. Country-specific authentication infrastructure was made interoperable through digital identity (e-ID). eIDAS and STORK solutions were provided by providing eIDAS/STORK plug-in. Provided an open-source, public testbed for implementing e-SENS standards (Minder). For example, European e-Procurement has proven possible thanks to the successful exchange of messages between different national procurement systems (Electronic Simple European Networked Services, 2017). Another project is the open-source e-public procurement platform (e- PRIOR) for the execution of back-office applications of public administrations in the Member States. This project facilitates the cross-border exchange of e-procurement documents, e.g., between a public administration in country A and suppliers in country B, by working with a large number of heterogeneous applications and by connecting to the Pan-European Public Procurement OnLine (PEPPOL). European Agencies and Institutions are implementing the system and making it available free of charge to all Member States wishing to exchange standardized electronic procurement documents via secure communication channels (Directorate-General for Informatics (DIGIT), 2022).

Since the mid-2000s, the electronic transformation of public procurement in Turkey has started keeping pace with the transformation trend in the world and the European Union[2]. E-forms were also included in this process by the end of 2022. In Turkey, although there are similar regulations, it is optional to use electronic media for all transactions during the preliminary preparatory procedures, tender process, and finalization of the tender. Still, many transactions can be carried out through EKAP. The existence of e-shopping and e-catalog systems in the Tender Electronic Daily (TED) system as a market system with product search, catalog of suppliers' goods, and its structure resembling a virtual market in terms of accessibility, timeliness, and usability are essential examples in terms of electronic procurement practice in Turkey. On the other and, the European Union's electronic procurement system draws attention to the existence of an integrated project with other community-based and trusting entrepreneurs based on the confidentiality of suppliers' information regarding public procurement. Implementing a similar practice in Turkey may prevent the acquisition of business secrets by rival enterprises by ensuring the confidentiality of supplier information in the market. It will also support protecting confidential information such as price offers and privacy. On the administrative side, it may be essential to protect sensitive data regarding public security, such as defense and security (OECD, 2007). At this point, the best practice is

[2] In some cases, however, they may not be available as a matter of course; where the use of electronic means of communication is not available or appropriate due to the specific nature of the procurement, where the use of licensed products is mandatory where the file format does not allow remote use, where the use of electronic means of communication requires specialised office equipment that is not generally available to contracting authorities, and where the procurement documents require physical or scaled models that cannot be transmitted using electronic means and, in addition, contracting authorities may decide to use traditional methods also "due to a breach of security of electronic means of communication or where it is necessary to protect the particularly sensitive nature of the information requiring such a high level of information. (Sigma (2016)).

to ensure changes in a direction that maintains the fine line between the principle of transparency and confidentiality.

To ensure more effective functioning of the electronic public procurement system, it is necessary to overcome the lack of motivation of administrations and suppliers. The most important means to overcome this lack of motivation is to share the costs incurred in reorganizing internal systems through various public projects and to ensure the employment of expert staff that are familiar with the electronic system and can implement it. It is necessary to develop international cooperation initiatives with the Government Procurement Agreement (GPA) and the United Nations Commission on International Trade Law (UNCITRAL) to adapt to developments quickly. Digital integration between institutions should be ensured. For example, although agreements have already been made with some banks in Turkey to carry out collateral transactions electronically, it still needs to be at a sufficient level. In this regard, agreements should be made with organizations and businesses in the market that influence public tenders in various ways to cooperate for online information exchange. Efforts to increase the population's education, the citizens' cultural welfare, and their susceptibility to ICT technology should be further improved (Svidroňová et al., 2016).

The transformation should be supported by selecting managers and officials with vision and expertise. In addition, another critical factor in ensuring support for electronic systems is that significant infrastructure problems affecting electronic communication technology, such as storage services, fiber internet speed, and cyber security, and ensuring supplier confidentiality, must be solved first. Effective consultancy and supportive services should be provided to prevent the reluctant behavior of suppliers towards e-procurement and their fear of making mistakes, especially when they have difficulty in keeping up with technological developments. Encouraging the frequent use of e-procurement methods such as electronic auction and dynamic procurement systems, which are electronic procurement tools, is very important for developing the electronic procurement system. Although the Public Procurement Law No. 4734 and the secondary legislation are sufficient, they have been and are being subjected to a series of regulations to keep them up to date. As it is known, the Public Procurement Directive 2004/18/EC, which was the basis for the preparation of legislation No. 4734, was replaced by the Public Procurement Directive 2014/24/EU. With the new Directive, a series of changes have been made regarding innovation, sustainability, and electronic transformation. The language of the Directive is mainly adapted to the e-transformation and sustainability approach (OECD, 2019a). When e-procurement is evaluated in terms of the Turkish Public Procurement Law, it is tough to say that the infrastructure of the Law is fully compatible with electronic transformation because the law is dated 2002, and the conditions of electronic change and interest in innovation in terms of the needs of that period. In this regard, it would be imperative to include technical information and phrases used in electronic platforms in the Law and to go from the classical tender-based Law systematics to the electronic-based Law systematics for the process to work more effectively.

2.1.2. South Korea

A study called the International Civil Service Effectiveness (InCiSE) Index was conducted in 2019 to measure the effectiveness of countries regarding public procurement (Oxford University, 2019). This study was conducted in 38 countries. To determine the effectiveness of countries in public procurement, issues such as the extent to which procurement processes are efficient, competitive, fair, and effective in return for public expenditures (the pursuit of value for money -VFM) are taken into account as the

basis. Under these headings, South Korea received the highest score in e-procurement. In this context, under the title of electronic procurement, the South Korean practice is analyzed since it is one of the first electronic regulations in the world, serves to improve the public procurement infrastructure of many countries, and covers all stages of public procurement.

The Korean government has attempted to establish a centralized e-procurement system, which includes a standardized bidding process and an online marketplace, bringing all procurement into a single location (Shin and Park, 2004). After successfully conducting pilot projects, in 2002, the Public Procurement Service (PPS), the central public procurement agency of the country, implemented a fully integrated e-procurement system (G2B) called Korea ON-line E-Procurement System (KONEPS), which is a centralized e-procurement system with End-to-End Functional Coverage (End-to-End Functional Coverage) that covers not only the bidding phase but also the entire public procurement phase. In 2013, a separate electronic public procurement law was established by enacting The Electronic Procurement Utilisation and Promotion Act (Kim, 2021). The KONEPS electronic public procurement system makes all stages of public procurement electronic, including the tender process, contracts, review and payment procedures, and documents related to public procurement converted into e-documents through one-time registration of contracting authorities and suppliers (PPS, www.g2b.go.kr). KONEPS is integrated with approximately 140 external systems for the electronic exchange of information, thus providing services in real-time for all stages, from the automatic collection of tenderers' qualification data, delivery reporting, e-invoicing, and e-invoicing, including e-guarantee, e-payment (idib). As the electronic infrastructure for all stages of public procurement is well established, the Government has obliged contracting authorities to carry out all procurement-related transactions through KONEPS (OECD, 2016; idib.). To ensure transparency in the public procurement process, the whole process is published online in real-time, and all information on tenders is publicly available (PPS, 2022).

In the Product Catalogue system, one of the KONEPS functions, there is a Government Article Classification System (Government Article Classification) application by international standards regarding the codes that enable suppliers to identify their goods and services. While this application prevents suppliers from being out of competition due to incorrect code transactions, it is also essential for obtaining the most advantageous price for the administrations. In addition, there are regulations on improving product information quality by improving various features such as technical specifications, processing conditions, and manufacturer information to meet international standards (Kim, 2021). Regarding e-certificates, an essential issue within the e-procurement system, the Public Procurement Service (PPS) implemented the Fingerprint Recognition e-Procurement application in 2010 to prevent corruption risks. According to internal and external studies on technological feasibility and effectiveness, the Fingerprint Recognition e-Tendering System is recognized as the best solution to fend off illegal bids. In the Fingerprint Recognition e-Tendering system, users can bid for only one company using a biometric security token. Signs and symptoms of illicit procurement practices are monitored using a corrupt activity analysis system and an informative reward policy. All companies suspected of engaging in corrupt or fraudulent practices are referred to the Fair Trade Committee for investigation. Rewards of up to USD 10,000 are available for whistleblowers of illegal e-Procurement. Disqualified bidders are automatically refused participation in the tender (PPS, www.g2b.go.kr).

In 2008, KONEPS was integrated with mobile applications, and an e-tendering service was launched via mobile phones. In 2011, PPS launched a new bidding service

that enables the bidding process to be carried out via smartphones through newly developed security tokens and applications related to the e-tendering process. The smartphone service enables data search, bidding, and bid opening anytime, anywhere. The SMS alert service informs registered users about bids in their area of interest (OECD, 2016b). Another important application for public procurement is the online shopping center (e-shopping center), which was introduced in 2006. The KONEPS e-shopping center brings convenience and choice to contracting authorities. This application allows contracting authorities to check the price and quality of products and make direct purchases. Contracting authorities can purchase technologically certified products and green products (appliances with high energy efficiency, energy saving, Eco-labelled products, and recycled products) as well as products suitable for special requests (PPS). The Multiple Award Scheme (MAS), introduced in procurement-related procedures, makes preliminary agreements with suppliers whose goods and services are equal or similar in terms of quality, performance, and efficiency, subject to a suitability test in terms of delivery performance and financial conditions. It is thus a system that enables contracting authorities to select the goods or services they want from KONEPS and fulfill various requirements. This system provides contracting authorities with options and operates in two stages (Kim, 2008).

The Republic of Korea also plays a pioneering role in sustainable public procurement. In this context, it is one of the leading countries that has succeeded in transferring sustainability efforts to the electronic environment by introducing the KONEPS electronic procurement system to implement and monitor green public procurement. In this context, the KONEPS system collects the latest data on green public procurement from the KONEPS e-shopping center, the Green Public Procurement Information System (GPIS-I) of the Institute of Industry and Technology (KEITI), and the Public Procurement Data System and reports them for all administrative stages (OECD, 2022). This approach has made KONEPS a world leader in terms of the Green Public Procurement Monitoring System (GPP). With the information collected on the level of procurement of green products, KEITI calculates the sustainability impact of the GPP. The new target for the Promotion of the Purchase of Green Products is to increase the purchase of green products in the public sector, which envisages at least 60 percent of the GPP by 2020 (Yaker et al., 2019). Savings from using KONEPS are estimated at around USD 8 billion per year, with about 80 percent of these savings (around USD 6.6 billion) coming from the private sector. With electronic conversion, it has been found that the time from the tender process to the contractor's identification has been reduced from 30 hours to 2 hours (Public Procurement Services Republic of Korea, 2016).

2.2. New Innovation and Sustainable Perspectives in Electronic Tendering

The digital transformation process in the execution of public procurement continues to change and develop continuously with the developing technology. New technology brings information and analyses that obtain many innovations from decision-making processes to reduce costs and increase transparency. These transformations bring with them the results of minimizing human error in administrative tasks and contribute to the automation of the process. The electronic transformation includes artificial intelligence and machine learning, big data and data analytics, blockchain, robotic process automation (RPA), augmented and virtual reality, and a communication network where physical objects are connected (with sensors, software, and other technologies to connect

to other devices and systems and exchange data) or larger systems (tracking devices, sensors, biochips or access devices, etc.). The use of the Internet of Things (IoT) has been the main argument of the projects (Federal Law of the Russian Federation, No. 44-FZ, Art 9). Many projects have been developed and implemented in these areas, and new projects are in progress. To increase long-term public procurement chain profitability, it is estimated that by 2025, 60% of investors in global public procurement chains will invest in software tools to support sustainability and circular economy business models (Krishnan et al., 2021).

2.2.1. Projects on Artificial Intelligence and Machine Learning

When we examine the projects related to Artificial Intelligence and Machine Learning, Artificial Intelligence (AI) technology was used to analyze departmental requirements directly based on the expenditure data across Health and Human Services (HHS) within the scope of the Buy Smarter with Analysis and Data Linking project in the USA. The analysis identifies duplicate purchases across organizations within HHS and is used to consolidate contract vehicles on this basis. It also aims at the structural transformation of the joint procurement of goods and services. Buy Smarter utilizes the HHS Accelerate blockchain project, which connects different datasets to access the data it needs (Reimagine HHS, 2018). In Ukraine, regarding the pre-tender process, the electronic procurement platform ProZorro uses artificial intelligence and machine learning to develop a model to predict the probability of a tender being awarded and successful. With another tool, it can predict the likelihood that a given tenderer will leave the platform without completing the tender. Regarding the post-tender process, ProZorro and uData School have developed a tool that clusters suppliers according to their history on the ProZorro platform. This analysis will be able to reveal non-obvious links between them or with publicly listed companies, possible fraud, and hidden trends. In Ukraine, when contracting authorities issue a call for tenders, tenderers often apply the wrong Common Procurement Vocabulary (CPV) code and participate in misclassification. This can lead to lower competition and higher costs as fewer bidders identify the tender. In response to this problem, a data science consultancy (uData) was developed to predict the correct CPV code. The developed algorithm does this based on textual input, including the description and title of the product (AI integration examples, 2022). In Ukraine, the DoZorro monitoring portal is a platform where each participant can provide feedback to its supplier. With the new version of this platform, software has been developed that can identify tenders with a high risk of corruption through Artificial Intelligence (AI) capabilities. According to the results of the beta test of this system, 37% more tenders were realized by preventing unjustified elimination and 298% more by preventing bidders' efforts to exclude each other (Transparency International Ukraine, 2018).

In Italy, the use of machine learning to identify hidden relationships between public administrations and private companies using unstructured information (such as public tender titles) from open data on public tenders is being done by the ANAC project (Lanotte, 2008). A similar application is being implemented by the Singapore Science, Technology and Research Agency, which has developed an artificial intelligence tool to identify and prevent possible corruption. AI algorithms analyze HR and finance data, procurement requests, tender approvals, and workflows to pick up patterns. It also looks at non-financial data, including details such as the names of family members of government employees and vendor employees (Basu, 2016). Similarly, an Italian project is collecting data using IBM's Watson technology to observe the behavior of users on the

Consp platform and catalog, and to use these observations to perform ex-post analyses to make recommendations on training, improvements to the catalog, suggesting new ways to interact, identifying collusion, etc. In obtaining the data, data from social media accounts such as Twitter, Facebook, and Instagram are also taken and analyzed (Ministero dell' Economia e delle Finanze, 2022).

In Taiwan, the vTaiwan project uses AI to provide audience insights to contracting authorities and build consensus during negotiations. A tool called Pol.is used to survey respondents and, using AI capabilities, creates a map of respondents, bringing together people with similar views. This allows users to see where there is division and consensus among thousands of other comments (Basu, 2018). In Switzerland, Primonas Kommers integrates an AI assistant into its e-procurement platform. This tool will perform a semantic check on requirements and other text in the procurement material, reducing the risk of bidders misunderstanding the tender material and thus reducing bidder risk (The Reuse Company, 2019). Similarly, in the UK, YPO has integrated a chatbot solution into its web pages, the Procurement Information Provider (PIP). The chatbot can interpret written user queries and direct them to the relevant sections of the YPO website (Say, 2018). The Nordic countries have been working on a joint project since May 2018 to enable authorities, companies, and organizations to use Artificial Intelligence (AI) in electronic public procurement (Nordic Council of Ministers, 2018). In the Finnish Hansel Oy program, Finland piloted a machine learning solution to classify data according to the United Nations Standard Products and Services Code (UNSPSC) to eliminate the complexity and various costs involved in uploading e-Invoice data from the e-Invoicing system to an open data portal -Discover Government Spending- (TutkiHankintoja, 2022). To accelerate the use of blockchain, AI, and quantum computing in the public sector, the Australian government has signed a whole-of-government service agreement with IBM that will give all federal departments access to IBM's AI and cloud technology (Burton, 2018). Working with Microsoft, the World Bank is also using AI technology to analyze procurement data and detect corrupt behavior patterns (Sharma, 2018).

2.2.2. Projects Related to Big Data and Data Analysis

Looking at the projects related to big data and data analysis, the Competition and Markets Authority in the UK aimed to prevent bid rigging by identifying the behavior and pricing patterns of unusual bidders from bidding cartels (Gov.uk, 2017). In South Korea, the Korean Fair Trade Commission (FTC) developed the Bid Rigging Indicator Analysis System (BRIAS), in 2006, by extracting data directly from the Korean e-Procurement system (KONEPS), such as bid price and the number of bidders to generate a bid-rigging score. Cases scoring above a certain threshold were flagged for further auditing. With BRIAS, which collects daily data, in 2012, out of approximately 20 000 cases, 200 cases were flagged for further inspection, but only 3 cases were found to be guilty (OECD, 2016a). The Chinese government, in cooperation with the e-Commerce platform provider Alibaba, procures public procurement from Chinese suppliers through Alibaba's B2B e-commerce platform under the Trade Assurance Programme. Alibaba conducts market research for Chinese procurement authorities and guarantees buyers that the products purchased will be delivered on time and will maintain the standard agreed upon by the buyer and supplier (PYMNTS, 2015). Italy's Consip platform and catalog collects data using IBM's Watson technology to observe users' behavior and use these observations to make ex-post analyses to make recommendations on training, improvements to the catalog, suggest new ways to interact, identify collusion, etc. (Ministero dell' Economia

e delle Finanze, 2022). Similarly, the World Bank is working with Microsoft to use artificial intelligence technology to analyze procurement data and identify corrupt behavior patterns (Sharma, 2018). These agreements are only related to the provision of technical infrastructure and not the direct provision of services through these private companies. Within the scope of the Red Flags project funded by the European Commission, it allows the public procurement process to be monitored by the administrations and automatically checks the public procurement documents with a special algorithm method and marks the risky documents (K-Monitor et al., 2022; Transparency International EU, 2022).

2.2.3. Blockchain-Related Projects

When we examine the projects related to Blockchain, in Hungary, within the scope of the TLE project, a cryptographic solution for the encryption of tender documents was created as a third-party web service with an alternative desktop application. Suppliers can encrypt tender documents through this service and send or upload their locked bids to a defined, separate channel. After the locking process is completed with asymmetric and symmetric encryption methods, the key is divided into fractions. These pieces are transmitted to a blockchain network under a specific smart contract to decrypt the key (Time Lock Encryption, 2022). In the US, HHS has developed a data lake that runs on the blockchain through HHS Accelerate, replacing multiple legacy systems used for contract writing and other procurement functions, which were considered ineffective. Data is pulled from existing contract writing systems, tagged, and stored on the blockchain. Alongside this data lake, a single interface has been developed that allows users to manage every step of the public procurement lifecycle, from initial market research to evaluation and contract closure, leveraging robotic process automation and machine learning technology that automates procurement functions at every stage (Schneider, 2018).

2.2.4. Projects Related to the Robotic Process

When we examine the projects related to the robotic process, a project launched in Portugal in 2018 aims to modernize the public procurement process by using robotic process automation and blockchain. IPO is developing a new all-in-one procurement management platform integrated with the systems of external entities (e.g., Vortal eProcurement platform), taking into account the inefficiency and human errors of the paper-based process. The solution is based on a 3-tier approach: the presentation layer, consisting of a user interface layer with RPA integrated to automate specific procedures; the logic layer, which includes the execution of business processes; and the data layer, equipped with blockchain, which ensures that information is auditable, traceable, secure and immutable. Tasks to be automated using robotic process automation include claim approval, a compilation of documents, and approval of suppliers (Institute of Oncology of Lisbon- IPO, 2018). In the Philippines, Project DIME (Digital Imaging for Monitoring and Evaluation) applies technologies such as drones, LIDAR and satellites, and geo-tagging to track performance and monitor supplier activities for selected high-value government projects developing physical infrastructure (Bhattacharya, 2018). To streamline administrative processes in public procurement in the Netherlands, UBR|HIS and the Service of Shared Service Centre Depositories (SSC DJI) have implemented Robotic Process Automation (RPA). This is robotic software that relieves the employees of HIS by

undertaking repetitive actions. This eases the workload of the employees and allows them to focus on more important tasks, while employee satisfaction is also noticeably increased (PIANOo, 2021). In the US, the IRS Procurement Office will be able to obtain information about vendors on public websites (FAPIIS and sam.gov) with a vendor identification number to alleviate the increasing workload in parallel with the reduction in the number of officers. The aim is thus to widen the circle of suppliers, including SMEs and innovation areas (General Procurement Administration, 2022).

3. COUNTRY PRACTICES RELATED TO GOOD GOVERNANCE

While higher levels of public procurement are expected in high-income countries because procurement, which is an essential part of the global economy, provides a basis for “white” public procurement through the presence of respected institutions, greater public sector capacity, and transparency, accountability, and an efficient process, low- and middle-income countries, which suffer from various disadvantages such as weaker institutions and high levels of informality, have high levels of public procurement (Grujicic et al., 2018). Public procurement has a significant impact on state policies as it has substantial effects on the principles of efficiency, effectiveness, and economy; on the other hand, it strengthens the adherence to the direction of accountability as it touches the budget, and finally, it feels various constitutional principles due to its effects such as participation in tenders and finalization of tenders. In addition, another fundamental problem arising from the implementers is corruption. While all these issues show the applicability and efficiency of countries' public procurement legislation, they also show how effectively the legislation and implementation work. A study called the International Civil Service Effectiveness (InCiSE) Index was conducted in 2019 to measure the effectiveness of countries regarding public procurement (Oxford University, 2019). This study was conducted in 38 countries. To determine the effectiveness of countries in public procurement, issues such as the extent to which procurement processes are efficient, competitive, fair, and effective in return for public expenditures (the pursuit of value for money -VFM) are considered as the basis. Under these main headings, the scope of e-procurement functions, integrity (perceptions of the level of corruption; adherence to rules and procedures; business ethics; fairness and impartiality; striving to serve citizens, protect the integrity and avoid conflicts of interest), transparency, and support for SMEs, governance and the role of the central procurement unit were considered.

In this assessment of procurement systems and practices, New Zealand is the most satisfactory country. The main reasons for New Zealand's highest score are the scope of e-procurement functions, the role of the central procurement unit, and the development of policies to enable SMEs to participate in central government public procurement. South Korea received the highest score for its competence in e-procurement. For Turkey, the results show that SMEs are above average in terms of participation in centralized public procurement and integrity principles but below average in terms of an e-procurement system, transparency, the role of the central procurement unit and management (Oxford University, 2019). When we look at the situation of countries in terms of measures to support public procurement capacity, it is seen that

countries such as New Zealand, Chile, Israel, France, the United Kingdom, and Canada stand out. Turkey, on the other hand, has only initiatives on the authorization model but is insufficient in terms of tender entry requirements according to the needs of the contracting authority, the recognition of public procurement as a profession, and the special training of those who will perform the work, and the public procurement competence framework (PPCF). A small number of countries apply recognition of public procurement as a profession. Some of these countries are Belgium, France, Hungary, Israel, Norway, Norway, Poland, Poland, Switzerland, Sweden, the Netherlands, the USA, and South Korea. The ability of organizations to work in an integrated manner with other organizations to improve their public procurement capacities is practiced in many countries, including Turkey (OECD, 2019b).

In this heading, the examples of countries that are successful in the topics determined for measuring success in public procurement were analyzed. Good governance, transparency, and integrity in public procurement are also vital and constitute the majority of the problems experienced in public procurement in many countries. Since these issues are complimentary, we have analyzed them under country examples regarding good governance. In addition, it was preferred to give short examples of good examples of various countries in determining the entries. Establishing a relationship of trust between the contracting authority and the supplier and informing the public is very important in terms of good governance (Sheng, 2022). Transparency in public procurement is vital in terms of contributing to competition as well as paving the way for public access to information with accountability as a requirement of good governance. For an adequate policy in public procurement, there are many factors, such as average tender times, justifications for exceptions, sound management of tender procedures, and protection of suppliers by acting by confidentiality rules (OECD, 2016b). Countries prioritize good governance and accountability by effectively implementing integrity policies in the public procurement process, transparency, stakeholder involvement, accessibility, use of e-public procurement, monitoring, and control mechanisms that support each other work together with integrity studies (OECD, 2016b). Under this heading, instead of analyzing the practices of a few countries, examples of good governance practices implemented in various countries will be mentioned. The reason for this approach is that good governance practice is not only the success of countries in public procurement but also the result of the sum of all governance factors. Therefore, in countries with an advanced understanding of corporate governance (such as Switzerland, Norway, and Finland), implementing general public procurement standards, transparency, and integrity policies is sufficient for success. In contrast, in some countries, more specific practices are included.

3.1. Dispute Resolution Ways

In Turkey, when the results of the analysis on public procurement are analyzed, it is seen that in case of disputes related to tenders, the tenderers first file a complaint with the contracting authority, which is the mandatory remedy, but they do not trust the decision made as a result of this application and take it to the next stage, which is the appeal to the Public Procurement Authority. However, 67% of the decisions of the objection authority at this stage result in a rejection decision against the tenderer, and 69% of these decisions result in the rejection of the tenderer's claim. On the other hand, after the rejection decision by the Public Procurement Authority, the highest coding rate is the corrective action decision, with 22%, while 21% is the annulment decision. The 1% of the Board's decision consists of the approval of the decisions made for the objections made to the administration, i.e., the justification of the tenderer who filed an objection

complaint. Two conclusions can be drawn from this situation. The first is that bidders do not trust contracting authorities. It can also be said that there is a lack of communication between the contracting authority and the tenderers. The second conclusion is that the bidders do not have sufficient confidence in the contracting authority's appeal authority. It is seen that the tenderers did not find the explanations at these stages acceptable and applied them to the objection complaint. It is seen that the majority of the issues that are made the subject of dispute and appealed to the Public Procurement Authority are due to the lack of trust between the contracting authority and the tenderer. In contrast, it is seen that the appeal authority is used by many tenderers to make sure of the contracting authority's complaint decision, even though it is unnecessary. For all these reasons, it would be essential for the effective execution of the Public Procurement process in Turkey to place dispute resolution authorities between the complaint authority to the administration and the objection authority to the Public Procurement Authority, which can represent the administration and bidders more independently. Similarly, Turkey's EU Turkey Report emphasizes that the Public Procurement Authority should establish a fully independent complaints-handling mechanism separate from its legislative and regulatory responsibilities (Turkey Report, 2021). Regarding dispute resolution in public procurement, Alternative Dispute Resolution in the US and the Ombudsman in Canada are examples of unique practices. These practices will set an important model for dispute resolution in public procurement in Turkey. Ombudsman practices, Alternative dispute resolution (ADR) methods will increase specialization in dispute resolution, bring important recommendations and accelerate the dispute resolution process. Another recommendation is that Turkey should establish a fully independent Public Procurement Review Board, separate from the Public Procurement Authority, and ensure the independence of the Board members, as explained in the EU Turkey Report (Turkey Report, 2020).

3.1.1. USA: Alternative Dispute Resolution

Alternative Dispute Resolution (ADR) practice in the USA has been established on a legal basis with the adoption of the Administrative Dispute Resolution Act (Public Law 101-552) in 1990. However, within the framework of the amendments made to the 1990 law, it has undergone a permanent change with the "Administrative Dispute Resolution Act of 1996 (Public Law 104- 320)" and has shaped today's ADR practice. In the US, ADR is not accepted as a prerequisite for litigation in the resolution of disputes specific to the administrative judiciary. Still, it is an optional but highly preferred method because it is a fast, safe, and more efficient method. A contractor and a contracting officer may directly invoke the alternative dispute resolution procedures in subchapter IV of chapter 5 of title 5 of the United States Code to resolve disputes that arise without regard to other administrative and judicial remedies (Miller, 2006). Upon the dispute arising, the contractor may apply to the contract appeals board for the resolution of the dispute or file a lawsuit directly to the United States Court of Federal Claims. In addition, if mutual voluntariness and legal conditions allow, the dispute can be resolved using any method included in ADR (Federal Acquisition Regulation, 2019, Subpart 33.211). In the Federal Acquisition Regulation (FAR), under the subheading "essential elements" of ADR, "(1) Existence of an issue in controversy; (2) A voluntary election by both parties to participate in the ADR process; (3) An agreement on alternative procedures and terms to be used in lieu instead of formal litigation; and (4) Participation in the process by officials of both parties who have the authority to resolve the issue in controversy". ADR procedures may

be used at any time when the contracting authority has the authority to resolve the matter in dispute. If a request has been submitted, ADR procedures may be applied to all or part of the request. When ADR procedures are used after issuing a contracting officer's final decision, their use does not change the time limits or procedural requirements for filing an appeal of the contracting officer's final decision. It does not constitute reconsidering the final decision (Federal Acquisition Regulation, 2019, Subpart 33.214). In this context, the use of ADR procedures as an alternative remedy for dispute resolution in Turkish public procurement may not only ease the workload of the courts but also support the principle of equality of the parties enshrined in the legal norm and increase the perception of confidence in suppliers, especially foreign suppliers, that disputes will be resolved impartially.

3.1.2. Canada: Procurement Ombudsman

The Office of the Procurement Ombudsman was established in 2008 as a reform to implement the Federal Accountability Action Plan (Government of Canada, 2006) to improve the efficiency and transparency of public procurement in Canada and contribute to accountability (Government of Canada, 2022). The Office of the Procurement Ombudsman (OPO) is an impartial and independent body of the Government of Canada that resolves public procurement contract disputes between suppliers and the government. A complaint can be filed regarding the award of a contract under \$30,300 for goods and \$121,200 for services, or the performance of a federal contract, regardless of the dollar value. Acting at the parties' request, i.e., as an optional remedy, the OPO provides dispute resolution services. On the other hand, it reviews governments' public procurement contracting problems and provides solutions on how to improve the process. In general, the Procurement Ombudsman examines the reasonable expectations and conduct of the parties to the public procurement contract, the extent to which the regulations made under the legislation have been complied with, whether the supplier has received sufficient information from the contracting authority under the right to information, the extent to which the supplier or contracting authority has been prejudiced in the process, the extent to which the fairness, openness or transparency of the procurement process has been ensured, and whether there is evidence that one of the parties has acted in bad faith. The Procurement Ombudsman will only substitute its judgment for that of those involved in the procurement process if there is sufficient written evidence to support the assessment. The Office makes dispute resolution recommendations for disputes concerning the interpretation or application of the terms and conditions of a contract (Government of Canada, 1985, c. F-11.) As is known, Ombudsman decisions are not binding. Their decisions are advisory. In this context, applying the Ombudsman in public tenders in Turkey may strengthen the perception of the principle of equality of the parties by providing an independent arbitrator between the contracting authority and the supplier. In this case, it may significantly contribute to finalizing decisions before resorting to the judicial stage. On the other hand, the review by the Procurement Ombudsman will contribute positively to the implementation process in public procurement by examining the contracts and the procurement process and announcing the result of the review with recommendations.

3.2. Legal Sanctions and Rules

The analysis of public procurement in Turkey revealed that the problems encountered in human-based practice, the low level of trust between the parties, and the efforts to improve the functioning of principles such as the prevention of corruption and fraud, the development of integrity and conflict of interest, the prevention of issues limiting competition and transparency, and the level of accountability, the application of competition rules, the focus on equal treatment, and reliability would be significant (Turkey Report, 2022; Turkey Report, 2021; Turkey Report, 2020, pp.74- 75). To support and enhance these aspects, it will be essential to strengthen the public procurement process in Turkey through legislation and rules. I think that increasing the functionality of the basic principles applicable in public tenders will contribute to significant reductions in the number of disputes, as it will bring meaningful solutions in terms of the lack of harmony between the administration and the bidders, trust problems, and the feeling of lack of merit. Under this heading, legal sanctions and examples of various legal norms will be examined within the framework of various country examples.

The Law on the Elimination and Prevention of Bid Rigging, the Federal Anti-Corruption Law on Public Procurement, the Code of Conduct on Procurement, and the Integrity Pact are essential practices to improve the quality of governance in public procurement. As it is known, the most important criticisms about public procurement in Turkey consist of violations of good governance rules such as violation of integrity rules and corruption. In this context, the existence of similar studies in Turkey will be vital in terms of good governance (EC, 2021). In Turkey, there is a Declaration of Taxpayers' Rights, which plays a role in the development of transparency, honesty, and accountability between the taxpayer and the administration in the field of taxation. Similarly, in the field of public procurement, determining the rules of conduct regarding tenders and presenting them to the public will be an essential regulation that will improve the quality of governance.

The Law on the Elimination and Prevention of Bid Rigging was adopted in 2002 under the leadership of the Japan Fair Trade Commission (JFTC) (Act No. 101 of 2002) to ensure transparent and fair conduct of public procurement and to prevent bid rigging. In Mexico, the Federal Anti-Corruption Law on Public Procurement (Ley Federal Anticorrupción en Contrataciones Públicas – LFACP, 2012) was adopted in 2012 to address disputes arising from corruption and fraud in public procurement. To ensure a common understanding between all parties involved in the public procurement process, the Code of Conduct for Contracts (CCP) (Public Works and Government Services Canada, 2022)[3] was established as a reminder of the responsibilities of the parties to ensure a clear statement of mutual expectations. The Code addresses issues of ethics and professionalism, conflict of interest, environmental protection, abuse and harassment, human rights and labor standards, trafficking in persons, forced labor, and child labor. The Code reflects the policy of the Government of Canada. The principles also frame set out in the Financial Administration Act (Government of Canada, 1985, c.F-11) and the Federal Accountability Act (Government of Canada, 2006, c.9).

Since 2015, the European Union has joined forces to promote the use of Integrity Pacts (IP) as a tool to increase efficiency in projects financed by European Union funds,

[3] A similar regulation exists in Spain, in the region of Catalonia, under the title *Código de principios y conductas recomendables en la contratación pública* (Recommended principles and codes of conduct in public procurement). In order to contribute to excellence in administrative action in the field of public procurement, on 1 July 2014, the Government approved through this document the basics and good practices in the day-to-day contracting activities of the departments of the Generalitat of Catalonia and the entities that are part of the public sector. Ayrıntılı bilgi için bkz; Gencat "Contractació pública", <https://contractacio.gencat.cat/ca/inici>, (26.11.2022).

develop innovative ways, increase transparency and accountability, increase citizens' participation and trust in public institutions, achieve cost savings and improve competition, and promote awareness and a better understanding of public procurement. Essentially, an Integrity Pact is a tool designed and initiated by the non-profit organization Transparency International (TI), which aims to reduce corrupt practices during procurement through an agreement between the procurement agency and potential vendors-bidders for specific procurements. In the European Union, the project “Integrity Pacts-Civilian Control Mechanism for Safeguarding EU Funds” covers 18 projects co-financed with cohesion policy funding in 11 Member States. To build integrity and transparency in the European Union, the Integrity Pacts Final Conference was organized on 8-9 February 2022 to learn about the lessons learned from the Integrity Pacts Pilot Project and to discuss the future of clean contracting and investment in Europe and set the vision for 2021-2027 (EC, 2022h,). For example, the Portuguese Directorate General for Cultural Heritage signed an Integrity Pact (IP) in December 2018 about the tender for the conservation and renovation of the UNESCO World Heritage-listed Alcobaça Monastery using EU funding. TI Portugal's monitoring team comprised legal, financial, architectural, engineering, and open tender data experts. During the pre-tender phase, TI Portugal analyzed the documentation. It made a series of recommendations leading to the adjustment of the criteria determining the price and cost of the intervention based on an analysis of similar contracts awarded in the last three years. As the monastery is one of the most popular cultural sites in the country and its restoration is a matter of great interest, to engage and interest the citizens in the project, TI Portugal set up a website to provide all the necessary information and provided an interactive feature to enable virtual monitoring of the progress. In addition, they organized on-site meetings and events to provide updates on the tender process (Bobkova and Aceves, 2022).

3.3. Increasing the Quality of Governance and Participation

The analysis of public procurement in Turkey identified problems in people-based practice and low levels of trust between the parties. Similarly, the EU report on Turkey emphasized the need to continue to improve the capacity of administrations to manage the public procurement process and to develop a risk indicator system, including integrity and conflict of interest rules, to ensure that corrupt and fraudulent practices are identified and acted upon (Turkey Report, 2019). Another critical aspect for improving the quality of governance in public procurement is that the staff involved in public procurement should be specialized in public procurement management and trained on corruption and integrity rules. In addition, in terms of auditing the process, conducting risk analyses on the whole process of public procurement with the Red flags application, as seen in the European Union practice, will facilitate the audit of procurement processes. In addition, increasing transparency and accountability by ensuring social participation in the execution of tenders will improve management quality and institutionalization. Implementing regulations similar to the practices in the examples in Turkey will increase transparency and accountability, ensure trust in the administration, and improve the quality of management as it will enable the parties to behave more honestly in tenders. Establishing a risk analysis system in public procurement, similar to the risk analysis system in tax auditing in Turkey, will facilitate the audit process. Implementing regulations in public procurement in Turkey can have several potential benefits, including increased trust between the administration and bidders and improved accountability to the public. By establishing clear rules and standards for public procurement processes, regulations can

help ensure that procurement decisions are made fairly and transparently and that all interested parties have an equal opportunity to participate in the bidding process.

3.3.1. Germany

To prevent corruption in public procurement, the Federal Procurement Agency has taken various measures to promote integrity among its staff, including support and counseling from the Contact Person for the Prevention of Corruption as part of integrity training, organization of workshops and training on corruption, and rotation of staff. Since 2001, new recruits to the organization have been required to attend an anti-corruption seminar. Since 2005, it has been mandatory for all staff. In this workshop, the staff is informed about the risks of being involved in bribery and the possible strategies of the briber. Another part of the training relates to how to act in the presence of dishonest practices such as corruption and bribery; for example, the staff is encouraged to “blow the whistle”. Another practice is to rotate staff after five to eight years to prevent them from avoiding long-term contact with suppliers, increase employee motivation, and make the job more attractive (Federal of Ministry Interior, 2022).

3.3.2. Mexico

To contribute to the control mechanisms for public procurement, as well as to actions promoting legality, efficiency, impartiality, transparency, and anti-corruption, since 2009[4], civil society organizations and individuals selected through public tendering by the Secretaría de la Función Pública (SFP) participate as Social Witnesses (Testigos Sociales) in all stages of public procurement above a certain threshold (Comisión Federal De Electricidad (CFE), 2022). At the end of their participation in public procurement, Social Witnesses prepare a report, a copy of which is submitted to the SFP and must be published on the website of the institution or organization concerned within 10 calendar days of their participation. Social Witnesses submit a partial report containing, among other activities, a chronological description of the relevant facts and observations, recommendations, proposals, and suggestions for each of the procurement procedure activities in which they participated, such as the analysis of the market research, the draft call for tender, the publication of the call for tender, the submission of tenders and the award of the contract (Secretaria De La Funcion Publica, 2021).

3.3.3. European Union

In the EU, Integrity Watch, which allows citizens, journalists, and civil society to monitor the integrity of decisions taken by politicians in the EU, has introduced Red flags

[4] Article 26 Ter of the Law on Public Procurement, Leases and Services (Ley de Adquisiciones, Arrendamientos y Servicios del Sector Público- LAASSP), Article 27 Bis of the Law on Public Works and Related Services (Ley de Obras Públicas y Servicios Relacionados con las Mismas- LOPSRM), Article 43 of the Law on Public-Private Partnerships (Ley de Asociaciones Publicas Privadas- LAPP), Article 27 bis of the Law on Public Works and Related Services (Ley de Obras Públicas y Servicios Relacionados con las Mismas- LOPSRM), Article 43 of the Law on Public-Private Partnerships (Ley de Asociaciones Publicas Privadas- LAPP). Article 27 bis of the Law on Public Works and Related Services (LOPSRM) provides for the participation of the Social Witness in public procurement processes.

to search, sort, and filter data that is scattered and difficult to access in member states (European Union Integrity Watch, 2022). It empowers EU institutions to monitor potential conflicts of interest, undue influence, and corruption. Red flags are derived by automatically checking procurement documents published in the Tender Electronic Database (TED) for all information and data using 20 risk indicators. The platform is designed to flag potential risks to promote good governance and best practices in how public authorities procure goods, services, and works on our behalf. The results are shown on the EU map on a country-by-country basis and as data. The results shown do not necessarily imply mismanagement, fraud, or corruption but identify potential risks. The conclusion to be drawn from the red flags is that flagged notifications require further investigation, and each indicator indicates whether due diligence on procurement processes has been completed. The original public procurement requests of any public authority, including basic information on procurement procedures, winning information on users, if any, details on contractors and the contracting authorities' rationale for selecting suppliers in the procurement, as well as regulations issued by contracting authorities, can be displayed.

Another practice introduced by Directive 2014/24/EU to improve the quality of management is life cycle costing (Directive 2014/24/EU, art. 68). This practice may be an essential solution to the incompatibility between the administration and the bidders, especially regarding the issue of excessively low bids, which seems to be the most common subject of dispute in Turkey. The reason for this is the use of methods in determining the approximate cost in Turkey that are not suitable for today's conditions, do not adequately analyze market conditions, and do not consider sustainability. In this context, life cycle costing, as described in the Directive, would be an essential recommendation for Turkey. In determining the most economically advantageous tender, contracting authorities should take into account the objectives of the Europe 2030 sustainable strategy for smart, sustainable, and inclusive growth (EC, 2019). In this context, the contracting authority's decision should not only be based on a price-based assessment but also on a life-cycle costing approach within the framework of innovative procurement policies that address sustainability[5]. In the new Directive, the Life-Cycle Costing (LCC) criterion is explained in detail in a separate article (Directive 2014/24/EU, art.68)[6], and non-price criteria, which were exemplified in the old Directive as "various criteria linked to the subject matter of the public procurement," are listed more explicitly in the new Directive, as well as some new technical criteria (e.g., quality of contractor personnel, accessibility, design for all users, etc.). The most important aspect of life cycle costing is that it considers not only the costs incurred during the procurement process but also all the costs that may arise during the process in which the goods and services will be

[5] Life cycle costing is an approach that includes costs such as R&D, production, transportation, use, maintenance, and end-of-life disposal costs, as well as environmental externalities such as pollution from the extraction of raw materials.

[6] Life Cycle Costing aims to identify a multi-objective best price-quality advantage. In this context, life cycle costing (Directive 2014/24, art.68); 1. Life-cycle costing shall, to the extent relevant cover parts or all of the following costs over the life cycle of a product, service or Works; (a) costs, borne by the contracting authority or other users, such as: (i) costs relating to acquisition, (ii) costs of use, such as consumption of energy and other resources, (iii) maintenance costs, (iv) end of life costs, such as collection and recycling costs. (b) costs imputed to environmental externalities linked to the product, service, or works during its life cycle, provided their monetary value can be determined and verified; such costs may include the cost of emissions of greenhouse gases and of other pollutant emissions and other climate change mitigation costs. 2. Where contracting authorities assess the costs using a life-cycle costing approach, they shall indicate in the procurement documents the data to be provided by the tenderers and the method which the contracting authority will use to determine the life-cycle costs on the basis of those data. The method used for the assessment of costs imputed to environmental externalities shall fulfil all of the following conditions: (a) it is based on objectively verifiable and non-discriminatory criteria. In particular, where it has not been established for repeated or continuous application, it shall not unduly favour or disadvantage certain economic operators; (b) it is accessible to all interested parties; (c) the data required can be provided with reasonable effort by normally diligent economic operators, including economic operators from third countries party to the GPA or other international agreements by which the Union is bound.

utilized. For example, when tendering for a road construction project, the environment, externalities, or future maintenance costs are often not considered. However, these costs, together with those calculated during the tendering process, constitute the actual cost of the good. Since this is often neglected, sometimes service, maintenance, repair, or sustainability costs can exceed procurement costs. In addition, the costs borne by society and the natural environment may be contrary to expectations (Czarnecki and Garsse, 2019). On the other hand, if life cycle costing is not taken into account in poorly prepared technical specifications, then a shrewd bidder may be able to gain a bid price advantage by moving some of the cost of the good in the tender process to the life cycle process.

The award criteria in Article 67 of the Directive are essentially based on the most economically advantageous tender. According to the modern standard of the most financially advantageous tender developed by the new Directive, the contracting authority should not use only the price or only the cost criterion when selecting the contractor but should take both requirements into account and also use a cost-effectiveness approach, such as life-cycle costing as set out in Article 68 of the Directive, to determine the best price-quality ratio to be assessed based on criteria including qualitative, environmental and social aspects linked to the subject matter of the public contract (Directive 2014/24/EU, pre.90). The contracting authority shall disclose in the contract documents the relative weight given to each of the criteria selected to determine the most economically advantageous tender, other than price. Bids are evaluated by awarding points according to pre-published standards. Each category is worth a certain amount, e.g., the price offered may be 40%, technical specifications 50%, and environmental impact 10% (Your Europe, 2022).

Conclusion and Suggestions

In this study, which analyses the problems experienced in the public procurement process in Turkey through text mining analysis of the decisions made on the complaints filed to the Public Procurement Authority, which is the regulatory and supervisory body, it is concluded that the source of the problems is not primarily due to the deficiencies arising from the legislation, but rather from the practice due to human-based issues. In the analysis, it has been observed that there are different results in terms of the contracting authority, which is the contracting authority, and the suppliers, which are the other party of the public procurement. In this context, on the contracting authority side, there is room for improvement in abnormally low tenders, preparation of specifications, receipt, opening of tenders, and evaluation of tenders. In contrast, fulfillment on the tenderers' side has significant room for improvement in completing procedures and compliance with formal requirements, particularly regarding participation in tenders, fulfilling responsibilities, and recourse to complaint authorities for disputes. Another important cause of disagreement is a severe lack of confidence on the part of tenderers in the actions of the contracting authority. It can also be argued that there is a lack of communication between the contracting authority and the tenderers. The main reason for this inference is that the vast majority of decisions of the contracting authority that are subject to appeal are, in fact, correct but are subject to appeal by tenderers. In the EU Turkey Report, the EU Turkey Report cites the lack of credibility of the Public Procurement Authority due to its lack of independence as the source of this problem. Therefore, the EU Turkey report recommends the establishment of an independent dispute resolution mechanism. The criticisms in the

EU Turkey reports, such as the perception of corruption, lack of accountability, lack of merit, and trained staff, explain the problems between contracting authorities and tenderers. On the other hand, the EU Turkey Reports emphasize that Turkey should continue its e-transformation efforts about public procurement while at the same time working on improving management capacity in public procurement, including integrity and conflict of interest rules; it is seen that the main issues such as the need to develop a risk indicator system that enables corruption and fraudulent practices to be detected on the spot and to take action against them, to avoid practices that limit competition and transparency, to amend the public procurement legislation in a way to make it more harmonized with the 2014 EU Directives and to increase transparency, and to avoid offset practices are emphasized.

One of the most important policies to be followed in solving the problems identified in the public procurement process in Turkey is the implementation of projects to support e-tender transformation that will minimize the human impact in the procurement process; exemplary practices in the e-tender process have been carefully examined in this study. Considering the objectives of Turkey's EU membership process, the most crucial example of e-transformation practices in EU public procurement has been examined primarily. Within the scope of EU e-transformation, projects such as transferring documents to the electronic environment, eCertis, TOOP, e-PRIOR, TED and SOLVIT portal, and SIMAP appear as essential transformations. On the other hand, the South Korea KONEPS application, which is an exemplary country in e-transformation in public procurement in line with Oxford University InCiSE index 2019 data, draws attention to e-shopping applications. In addition, projects related to artificial intelligence and machine learning, big data and data analysis, blockchain, and robotic processes in the e-transformation process will have multifaceted positive effects on Turkey's public procurement process. To improve the quality of management in the public procurement process in Turkey, the Ombudsman and ADR mechanisms, as independent bodies, have essential qualities to contribute to the dispute resolution process. Apart from these, it is seen that legal regulations such as the Law on the Elimination and Prevention of Bid Rigging, the Federal Anti-Corruption Law on Public Procurement, the Code of Conduct on Procurement, and the Integrity Pact are used to support the public procurement process to contribute to the sense of trust to be developed between the parties and to strengthen institutionalization. To continue to improve the capacity of contracting authorities to manage the public procurement process and to enhance integrity and transparency, various practices have been introduced to improve the quality of governance and participation. For this purpose, practices for public procurement personnel based on training and rotation, practices that support the involvement of non-governmental organizations, and individuals in tenders to increase participation come to the forefront in Germany. In contrast, the EU Red Flag application comes to the fore to support transparency and public opinion and to develop a risk indicator system that enables corruption and fraudulent practices to be detected and acted upon. As a result of the findings of this study, various recommendations for public procurement in Turkey are presented, supported by examples from the literature.

In Turkey, there are many dispute referrals on the issue of abnormally low tenders in public procurement. The continuity of the dispute regarding this issue also shows that the administrations need to be more successful in calculating the approximate cost. Because in today's world, many factors affecting the price, such as technology, sustainability, renewable energy, and environmentally friendly practices, are not suitable for the current approximate cost calculation method. The most important rule recommended for this is the life cycle costing approach implemented in Directive 2014/24/EU. This practice integrates new developments into determining the approximate

cost and encourages calculating realistic expenses. Moreover, integrating this practice into procurement legislation will contribute significantly to Turkey's sustainable development efforts. This is because the current practice in Turkey is based on the preparation of price-based approximate cost (Article 8 of Law No. 4734) while neglecting the non-price elements that encourage sustainability. This makes it difficult to determine the approximate multidimensional cost by the market price. On the other hand, Turkish procurement legislation can only be integrated into the electronic transformation, be compatible with sustainability procurement, and support life cycle costing if there is a new Public Procurement Law similar to 2014/24/EU. Other solutions would be limited to patching the Law. Regarding the spirit of the law, it would be appropriate to prepare a total regulation, i.e., a new law. The current Law No. 4734 represents Directive 2004/18/EC. As it is known, this Directive has been replaced by the new Directive. For Turkey, the correct practice would be to continue with a new Law instead of renewing the old one.

It would be appropriate to use electronic documents and applications intensively in public procurement in Turkey to minimize the disputes arising from human errors of contracting authorities and bidders in public procurement in Turkey and to facilitate bidders' applications for tenders and prevent them from losing their rights to apply for their rights in disputes due to incomplete fulfillment of the rules of law in the complaint and objection authorities to which they use to seek their rights in disputes. In electronic public procurement, e-systems should be used more effectively. In this regard, it would be appropriate to integrate the e-Market system into the EKAP system, as in the EU E-tendering system, CONEPS. With this application, the central administration or the Public Procurement Authority will organize tenders for general needs in advance and carry out tenders by making framework agreements. Thus, in many cases, the administrations' needs will be readily available in this market, and the administrations will be able to purchase their needs from this market by signing mutual agreements with ready suppliers. This system is both a transparent and a more modern version of the State Supply Office in Turkey, as it complies with the tender legislation. With this application, bidders who wish to participate in the e-Market system will be allowed to become a member of the platform to be created in EKAP, and those who are qualified to become a member in this framework will indirectly fulfill the conditions for being a tender bidder. Thus, the risks (qualification examinations, prohibition examinations, etc.) during public institutions' preliminary assessment of tender bidders will be eliminated. This practice will provide significant time and cost savings due to its practicality. In addition, since all tender announcements can be followed through e-Marketplace and tender bidders can be examined transparently, transparency and equal treatment principles are essential. Another suggestion for the e-Marketplace process is that it should be possible for any contracting authority to convert its procurement need into a request through this Marketplace and for other contracting officers with similar requirements to participate. This would enable many contracting sources to act together and thus save money in the procurement process. On the other hand, more use should be made of the document schemes and applications (e.g., eCertis, TOOP, ePO, DIGIWHIST, MET) in the Tenders Electronic Daily (TED) used in EU public procurement.

Another pillar of electronic transformation is project-based fundamental changes. These transformations aim to minimize the human factor in tenders and prevent disputes that may arise. At the same time, the widespread use of electronic applications in tenders will significantly prevent disputes between contracting authorities and bidders in Turkey. In addition, the bidders who bid for the tender do not comply with the rules of procedure, principles, and form in applying for dispute resolution procedures for the tender. For this reason, many appeals are deemed invalid. These practices make it necessary to simplify procurement procedures in general, facilitate document and certificate obligations, and

increase accessibility through digital transformation. In particular, the use of new technologies, such as blockchain technologies and machine learning technologies, as in the examples described in the literature review, will facilitate the functioning of the process. Italy uses machine learning technology ANAC to identify hidden relationships between public administrations and companies in this context. At the same time, a similar application in Singapore analyzes HR and financial data, procurement requests, tender approvals, and workflows. It also looks at non-financial data, including details such as the names of family members of government employees and vendor employees. Similarly, the Consip platform observes parties' behavior in Italy and collects data from Twitter, Facebook, and Instagram to train, develop new methods, and uncover hidden relationships. As another example of an application, YPO in the United Kingdom and Primonas Kommers in Switzerland use artificial intelligence as an assistant to create a chat engine solution and provide constructive solutions to all auction-related problems of the parties. As another application, UNSPSC has launched a pilot application in Scandinavian countries to prevent issues that may arise from transferring e-invoice data to another computer. It is also observed that countries such as Europe and Italy are acting together with IBM regarding using artificial intelligence and cloud technology. To prevent bid rigging in public procurement, the UK uses data analytics to identify procurement cartels' unusual bidding behavior and pricing patterns. An important example is the BRIAS application that analyzes bid data in KONEPS, the South Korean e-procurement system. As an example of blockchain, the US uses robotic process automation to enable users to implement a public procurement lifecycle module with a single interface, from initial market research to evaluation and contract closure, to facilitate the work of administrations and minimize errors. Regarding robotic processes, taking into account the inefficiencies and human errors of the paper-based process in place in Portugal, tasks are automated, thus automating several essential aspects such as request approval, a compilation of documents, and approval of suppliers. Similar practices can be found in the Netherlands and Israel. All these practices will not only minimize the human factor but also provide meaningful solutions to the criticisms in the EU Turkey Report, such as corruption and favoritism. These solutions will therefore rebuild the relationship of trust between the administration and the petitioner, which is one of the important causes of disputes in Turkey. It will also pave the way for significantly reducing disputes arising from human-based errors in Turkey.

On the other hand, the personnel in charge of tender commissions should be subjected to frequent in-service training and be brought together with bidders, as in Germany. In addition, similar to Germany, it would be appropriate to rotate the personnel who have completed a certain number of years of service and assign them to different cities or institutions. This would reduce the problems of favoritism and prevent professional attrition. Changes and competition may encourage staff to improve themselves. The practice of social witnesses in Mexico is also noteworthy. With this practice, social witnesses participate in almost every stage of the procurement process, such as the analysis of the market research, the draft call for tenders, the publication of the call for tenders, the submission of bids, and the signing of the contract, and prepare reports and ensure that the public is involved in the procurement process. The Law on the Elimination and Prevention of Bid Rigging, the Federal Anti-Corruption Law on Public Procurement, the Code of Conduct on Procurement, and the Integrity Pact are also essential practices to improve the quality of governance in public procurement. As is known, the most significant criticisms of public procurement in Turkey are violations of good governance rules, such as breaches of integrity rules and corruption. In this context, similar studies in Turkey will be critical regarding good governance. In Turkey's taxation field, there is the Declaration of Taxpayers' Rights, which improves the transparency,

honesty, and accountability relationship between the taxpayer and the administration. Similarly, in the area of public procurement, setting rules of conduct for tenders and making them publicly available would be an essential regulation to improve the quality of governance. In Mexico, the Federal Anti-Corruption Law on Public Procurement (Ley Federal Anticorrupción en Contrataciones Públicas - LFACP) was adopted in 2012 to address disputes arising from corruption and fraud in public procurement. To ensure a common understanding between all parties involved in the public procurement process, the Code of Conduct on Procurement (CCP) was established as a reminder of the parties' responsibilities to ensure a clear statement of mutual expectations. In this regard, the Red Flags practice implemented in the European Union is another critical issue that can be emphasized in terms of transparency. These steps will provide meaningful solutions to the criticisms made in the European Union progress reports on public procurement.

Other issues that could be useful in practice are the introduction of more professional methods for dispute resolution. Including exercises that increase public confidence in these practices is also essential. To this end, the involvement of procurement Ombudsmen in resolving procurement disputes, as in Canada, and the use of Alternative Dispute Resolution Mechanisms, similar to the US practice, would eliminate the monopoly of contracting authorities in resolving disputes in Turkey. Moreover, the existence of different options will ease the burden on administrations and increase the bidders' faith in dispute resolution.

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