Chapter 7
Agile Collaborative Architecture for the Development of E-Government Services in Romania: Electronic Public Procurement Case Study

Marian Stoica, Marinela Mircea, and Bogdan Ghilic-Micu

Abstract When speaking about electronic government, Romania is giving a special attention to relations between government and organizations. The main reason is the fact that private organizations are the driving force of economic growth. On the other hand, are two principles of public procurement: more attention to transparency and efficient use of public funds. SEAP (Public Procurement Electronic System) as G2B eGovernment solution was gradually developed starting 2002, offering numerous benefits. Still, it does not solve all the problems and challenges of the procurement process. This chapter offers a general view of the current state of the public procurement in Romanian organizations, highlighting the strengths and weaknesses of SEAP. Also, we present solutions for improvement of public procurement process, both from legislative and technological perspective. Special attention is given to a performant collaborative system that helps solve challenges of procurement, both on national and international level. Modern approaches like: Service Oriented Architecture, Business Intelligence, Business Rules, Business Process Management, Cloud Computing and others are used to create an agile architecture for development of G2B e-procurement services.

Keywords Electronic public procurement • Business process management (BPM) • Business rules (BR) • Service-oriented architecture (SOA) • Business intelligence (BI) • Cloud computing • Collaborative system • E-procurement • Enterprise architecture (EA) • Knowledge management (KM)

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1 Introduction

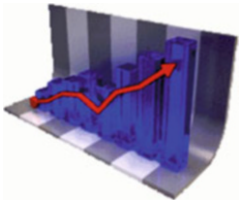
A support element for implementation of basic processes in public institutions is public procurement. In the current context, the use of information and communications technology is a must, considering the level of expenditures, complexity vulnerability and importance of operations, the responsibility involved by public procurement and the need to align to European requirements.

The Romanian Public Procurement Electronic System (SEAP) was gradually developed starting in 2002. SEAP was built to provide transparency in achieving goals, prevent corruption (through use of electronic means) and support the European exchange of information about public institutions. In 2006 a new version of SEAP was launched, aligned to the new regulations in the field and allowing all kind of public procurement procedures allowed by Romanian legislation, aligned to the European one. SEAP is an integrated system, built on a high availability architecture, which ensures a high level of security. It is a mix of proprietary and open source technologies, according to global trends in designing complex information systems.

The new way of doing public procurement is an important driving factor for integration in e-business: it is an element included in the suite of applications required to implement the concept of "e-government"; it includes the use of internet in administration and the dialog between administration, organizations and citizens; facilitates the change to a paper-less administration, without bureaucracy; ensures information confidentiality and legislative compliance to the status of electronic signatures.

SEAP provides numerous benefits, like: increased transparency, reduced costs, facilitates the development of electronic commerce, reduces time-consuming activities, increases the efficiency of local and central administrations, allows easy auditing of public procurement processes, and provides a high security and trust framework for public funds management activities. The success of the current national electronic system for public procurement is highlighted by the published statistics (Fig. 7.1).

The transition process towards an ideal public procurement electronic system in Romania has faced challenges brought in by the legislative modifications to the Government Emergency Enactment OUG 34/2006. Some of the most significant



Registered Contracting Authorities/Suppliers:	15,476/68,256
Published Notices/Request For Quotation Invitations:	293,768/361,793
Notices Sent To OJEC:	145,562
Published Catalog Products:	564,530
Published Requests For Quotation/Direct Aquisitions:	89,415/8,829,820
Awarded Aquisitions Total:	175,774,884,921.23 RON

Fig. 7.1 Published statistics for SEAP (according with www.e-licitatie.ro)

challenges in the transition process are: resistance to transfer of information and services to online environment, dispersed procurement activities, lack of institution level procurement management, lack of monitoring and control systems on the system beneficiary's end, lack of inter-organization collaboration regarding procurement. Also, the procurement process is influenced by lots of internal and external factors like: diverse requests, changes in preferences, diversity of funding sources and necessities, changes in legislation, interaction with providers and existing problems within informational flows.

Political, legislative and technological challenges and problems (during 2006–2015) require a reform in national legislation and the creation and use of a collaborative performant system that will ensure transparency and efficiency of the public procurement process (national strategy in public procurement 2015–2020). The information system must be based on an agile architecture that uses modern approaches (like SOA, BI, BPM, BR, KM) as support in solving integration challenges and helps solve current problems.

2 Current State of Public Procurement in Romanian Institutions

Public procurement system in Romania has two components (institutional and legislative) and currently undergoes a transition process towards a performant collaborative system for public procurement, aligned to European legislation. The **institutional component** comprises specific institutions that contribute to regulation and oversight of public procurement contract adjudication (Fig. 7.2):

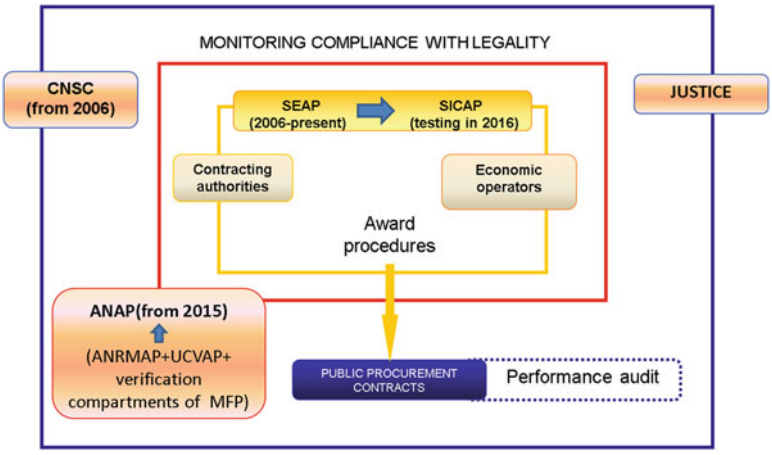


Fig. 7.2 Institutional component

- National Public Procurement Agency (ANAP), founded in 2015 as public institution, with juridical personality, subordinated to the Public Finance Ministry (MFP) [1]. ANAP took over the attributions, activity, jobs and personnel from National Authority for Regulation and Monitoring of Public Procurement (ANRMAP founded in 2005), from the Unit for Coordination and Verification of Public Procurement (UCVAP founded in 2006 under the Public Finance Ministry) and from departments that verify public procurement within regional general divisions of public finances.
- National Council for Solving Complaints (CNSC) founded in 2006 as independent jurisdictional-administrative organism;
- SEAP, that functions according to OUG 34/2006 with all subsequent modifications and additions regarding public procurement process using and managing all activities through electronic means. SEAP is managed by the Agency for Romania Digital Agenda (AADR) and is currently one of the most used government systems. SEAP will be replaced by SICAP (Collaborative Informatics System for a performant environment of Public Procurement), which will be launched for national testing starting in August 2016.

Between 2006 and April 2015 the institutional component was confronted with distributed functions fragmented and redundant between several institutions with key competences in public procurement: ANRMAP, UCVAP, CNSC, AADR, Romanian Court of Accounts and Audit Authority, Competition Council—control activities; Appeal courts—instances with competencies in solving complaints against decisions of CNSC (second body for solving complaints). Also, the institutional component was concentrated on procedural aspects, detrimental to efficient use of funds. Due to this situation, in 2015 ANAP was established.

The **legal component** comprises the legislative package that regulates adjudication of public procurement contracts, public works concessions contracts and service concessions contracts available on ANAP site. Currently there are 52 normative acts that directly regulate public procurement in Romania. Figure 7.3 shows modifications to Romanian legislation during 2006–2015, without including abrogated legislation [1].

Due to the large number of normative acts, frequent changes, lack of transparency and efficiency of investments, numerous complaints and especially lack of project sustainability, in 2015 ANAP has authored the national public procurement legislation, aligned to the European one. Current strategy is presented in a document that proposes actions defining the government policy regarding the reformation of the national public procurement system in 2015–2020.

In this context, public procurement becomes the main tool for unblocking economic growth on European level. Through prime minister Decision no. 218/2014 regarding setting up of the inter ministry committee for reformation of legislative and institutional framework for public procurement, Romanian government has created an operative work frame for system reformation.

National strategy for public procurement, passed on 27.10.2015 is structured on five chapters that tackle the major challenges identified, adequate action directions

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Primary legislation									
3	1	2	3	3	2	1	3	2	1
Secondary legislation									
2	1	1	2	1	1	1	1	0	0
Tertiary legislation									
0	0	0	2	1	2	6	2	0	0

Fig. 7.3 Public procurement legislation dynamics during 2006–2015

to reform the system, as well as a series of support documents that describe the identified situations. Each chapter provides an action plan with clear deadlines, responsible institutions, and foreseen impact and performance indicators [1].

The identified problems are analyzed in detail in this strategy, which integrates solutions to correct: the legislative framework, institutional system deficiencies, public procurement process, strengthening of administrative capacity of contracting authorities, monitoring and oversight. The proposed measures target mainly an increased efficiency, effectiveness, economy, with integrity and responsibility.

The general objective of the national strategy is *improvement of the public procurement system in Romania, through implementation of the new European directives into national legislation, reformation of institutional framework and continued functionality of the system*. In order to achieve the general objective, the strategy seeks to achieve the following specific goals [1]:

- A new legislative package, flexible and coherent, passed in February 2016;
- Consolidation of ANAP, from functional and operational points of view, so it can coherently fulfil the tasks stipulated in the strategy;
- Consolidation of the remedy and complaint system through dedicated legislation;
- Development of a professional evolution within the system for the personnel responsible for public procurement;
- Fight corruption through increased use of electronic means for procurement procedures and prevent conflicts of interests through the prevention system.

The new legislation (law 98/2016 regarding public procurement) brings more transparency, since all procurement will take place exclusively online, through SEAP (and soon through the new SICAP system). Already some of the procurement procedures take place exclusively online, and until 2018 all procedures will be carried online [2].

2.1 Public Procurement Electronic System (SEAP)

The e-licitatie application, operational since 2006, was appreciated on international level, repeatedly receiving awards and mentions as "good practice". Also, since January 1, 2007, the www.e-licitatie.ro portal has become OJS eSender, meaning it is the point that sends electronic announcements to the European Union Official Journal [3].

SEAP is an open and transparent system that provides access to public funding contracts. It is a centralized system that facilitates meeting of offer and demand on national level, providing economic operators fast and easy access to requests from contracting authorities. By registering in a single system and choosing various search criteria (CPV code—Common Procurement Vocabulary, contract type, procedure type etc.) SEAP sends alerts to economic operators with opportunities that are added to the system.

Strategic implications of the system are important both for government, and for the business environment. Legal regulations aim to create a global market, where public and private sectors can do business in a simple, efficient, transparent and correct manner, market size being very important (Fig. 7.4). For example, in 2013 the value of goods, works and services bought with public funds was 13.3% of Romanian GDP, of which 9.46% (14,250 million Euros) form state budget and ~3.87% (5,491 million Euros) from European funds and other sources [1]. Also, the ANAP president highlighted the importance of regulations because public procurement totals 15 billion Euros, over 10% of Romanian GDP [4].

SEAP is permanently updated, according to legal regulations, but also by offering new features that support both public and private sector. For example, following the passing of new methodological normative for implementation of public/sectorial/framework procurement contract award, starting on 08.06.2016, SEAP provides new features like:

- Market consultation, as preliminary step in public procurement;
- Documentation on how to generate, fill in DUAE as Unique European Procurement Document both for contracting authorities and economic operators as users of SEAP;
- The possibility to publish Annual Public Procurement Plan/biannual excerpts from Annual Public Procurement Plan;
- Technical ability to upload intermediary reports during the public procurement process etc.

Also, awarding procedures may be initiated, including the simplified procedure, which can take place in one or two stages; awarding documentation includes new sections like contracting strategy and declaration of decision positions within contracting agency that organizes the awarding procedure.

The government supports contracting authorities and economic operators through a demo version of SEAP available at http://www.demo.e-licitatie.ro:8080/. Also, it monitors the system information that may influence economic activities (Fig. 7.5).

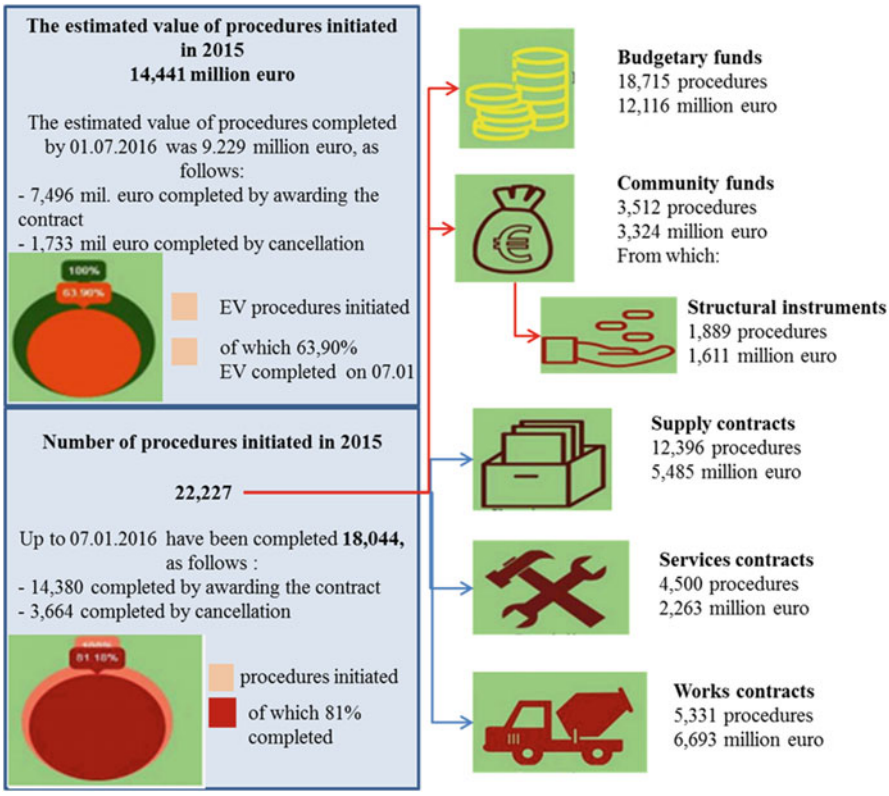


Fig. 7.4 Market size (according with [5])

SEAP provides numerous benefits, but according to studies carried out, current awarding procedures in Romania are inefficient, hurdled by bureaucracy barriers and do not target the efficient use of funds, which is a cause of low absorption rate and corrections to European funds financing [1].

2.2 SEAP-SICAP: Moving to a Full Electronic Public Procurement Solution

As a starting point in this transition, we propose an approach built on the model of a complete electronic procurement process. Developed in an agile manner, this model involves the three SCRUM methodology specific phases: pre-game, game and post-game. In the context of public procurement, the game is the actual procurement procedure, which leads to the generic model shown in Fig. 7.6.

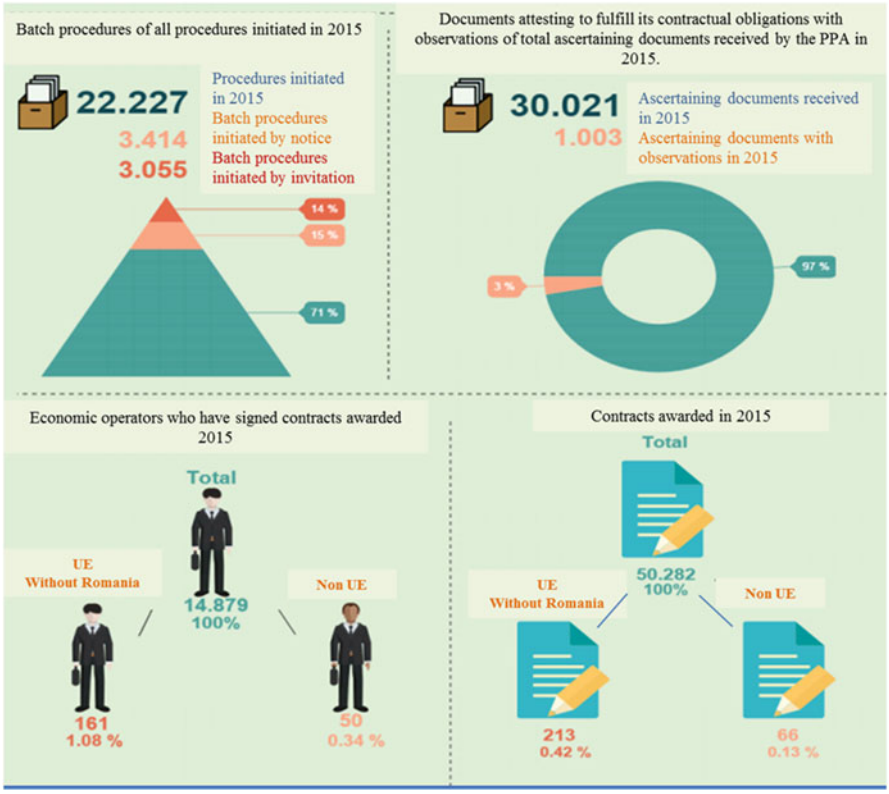


Fig. 7.5 Monitoring system information that may influence economic activities [5]

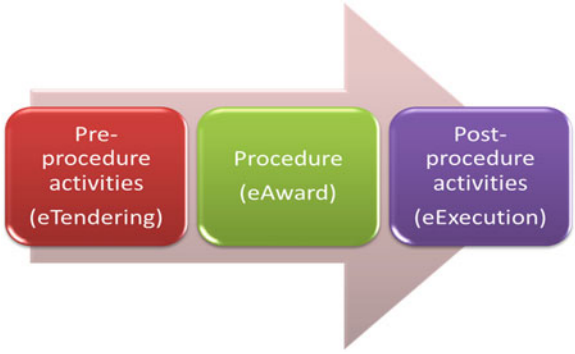


Fig. 7.6 Generic agile model for e-procurement

In the context of public procurement, the pre-game phase (*eTendering*) must include specific activities to facilitate the exchange of information between the electronic system and participating actors in the procurement procedure (contracting authorities, economic operators, public institutions involved). These specific

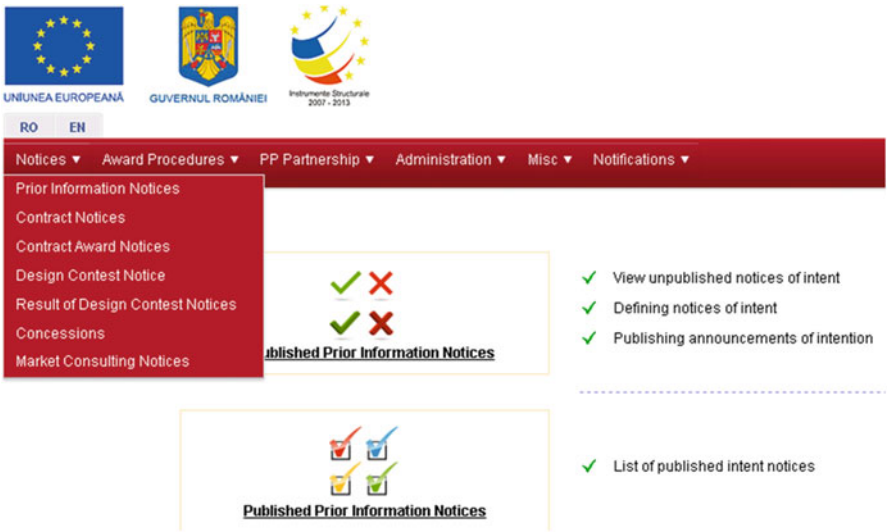


Fig. 7.7 eTendering features in SEAP

information activities may be grouped in a specialized module—*eDocumentation*. This phase must also provide features to enroll/authenticate in the electronic system, through another specialized module—*eSubmission*. At the end of pre-game phase, participants must be able to choose/decide the type of public procurement through a dedicate module—*eAuctions*.

Romanian SEAP implements about 80% of the pre-game specific activities (Fig. 7.7—print screen from SEAP). This is achieved through options *Notices* (for publishing documentation, asking questions/receiving answers through SEAP). Also, SEAP provides features to verify compliance to contracting authorities' criteria compare offers and compute scores for them, description and use of formulas.

SEAP completes the first phase of the agile electronic public procurement model with the feature called *AwardPocedures* (Fig. 7.8—print screen from SEAP), through which participants may decide on the type of procedure to be performed. The next step of the proposed model is the actual electronic public procurement procedure through the game phase (*eAward*).

The post-game phase (*eExecution*) of the generic agile eProcurement model involves activities related to public procurement contract management and progress (order management, bills, payment orders, addendums etc.), which currently are not implemented in SEAP. This is why AADR considers a priority the implementation of Open Contracting Data Standard in SEAP, as an instrument to increase transparency of public procurement; this is a feature of the project developed on European funding—SICAP. Open Contracting Data Standard is available in SEAP starting with August 2016 [3]. This involves providing (in a processable format—

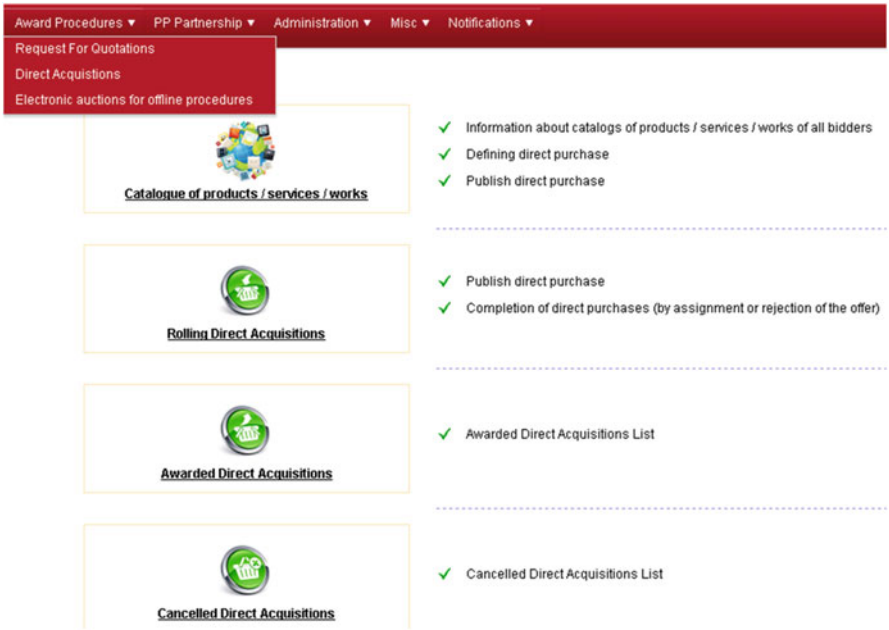


Fig. 7.8 Award procedures feature in SEAP

JSON) the following data: information about procurement planning, information related to the contracting/procedure initiating authority, information related to contract implementation (contract phase, description of contract phase, phase deadline, contract status, contract related documents, list of contract related expenses), information related to payments made for a contract (transaction date, source of money/transaction, payer, payment beneficiary, information about addendums, modifications of the contract, reasons for rejecting the addendums).

SEAP provides a series of features and comes to support the legislation by providing a central hub for procurement on national level, transparency, search and reporting features, the possibility to take advantage of opportunities to buy/sell, a space where offer and demand can meet etc. In order to implement the principle of efficient use of public funds, SEAP must be used together with other modern technological solutions.

Unfortunately, SEAP also has some shortcomings. For example, it is not designed to conduct calculations and reports regarding cost-efficiency or cost-benefits indicators [6], does not allow advanced searches and searching is slowed down by the need to input a CAPTCHA code. Even more, the file format is not standardized for multi-criterial searches and there are no management modules for contracts, payments, orders, statistical analysis.

The analysis of the national public procurement system has led to identification of a series of shortcoming that have lead, over time, to inefficient use of public funds,

bureaucratic barriers and a lack of responsibility, numerous complaints that led to prolongation of procedures or even cancelling them, low use of electronic means, financial corrections and low absorption of European funds.

Considering existing problems (detailed in [1]), the current goal is to develop a performant environment for public procurement aligned with European Union requirements and current legislation regarding public procurement. SICAP provides increased efficiency of public services through administrative services provided via modern electronic means, which are efficient, effective and easily accessible, based on interoperability paradigms, security and traceability, in order to create services for citizens, juridical persons and public administration [3].

The new SICAP system comes to help solve the problems of SEAP, increase the automation of public procurement and its management and the efficiency of public procurement activities. SICAP has advanced search specifications, preliminary consultation of market, a payment module and automated activation of pre-payments, a dedicated module for public procurement, uses intelligent forms and provides online training for users (according to SEAP). SICAP will have an intuitive interface, starting with registration in the system, so it will be easy to use by contracting authorities, economic operators and institutions involved in regulating, verifying and monitoring public procurement, which will be interconnected with the system.

SICAP will have an extended reporting and statistics service, through which all actors in public procurement will be able to generate reports that will help create a better general view both on own procurement as well as all procurement activities that take place in a given time frame. Also, the reports can be exported from SICAP in editable formats to be processed and interpreted. There will also be a series of statistics regarding public procurement in Romania available to the public.

The public procurement contracts module in SICAP will allow, both for contracting authorities and economic operators, managing all types of contracts and addendums signed as result of public procurement procedures performed through the system. Also, SICAP will provide extended web services for interoperability.

Another goal is to interconnect SICAP and informatics system of CNSC, so that ANAP can access all the data required for monitoring activities and access aggregated decisions issued by CNSC for public procurement procedures.

3 Agile Architecture for Development of E-Government Services in Public Procurement (G2B)

Considering the problems and challenges facing a general public procurement process, there is a need for an agile architecture that adapts fast to legislative changes and ensures efficiency of the process itself. Using an agile architecture, based on modern technological solutions that lead to decreased costs and increased flexibility, is a critical solution required to meet the challenges of the current business environment and knowledge society.

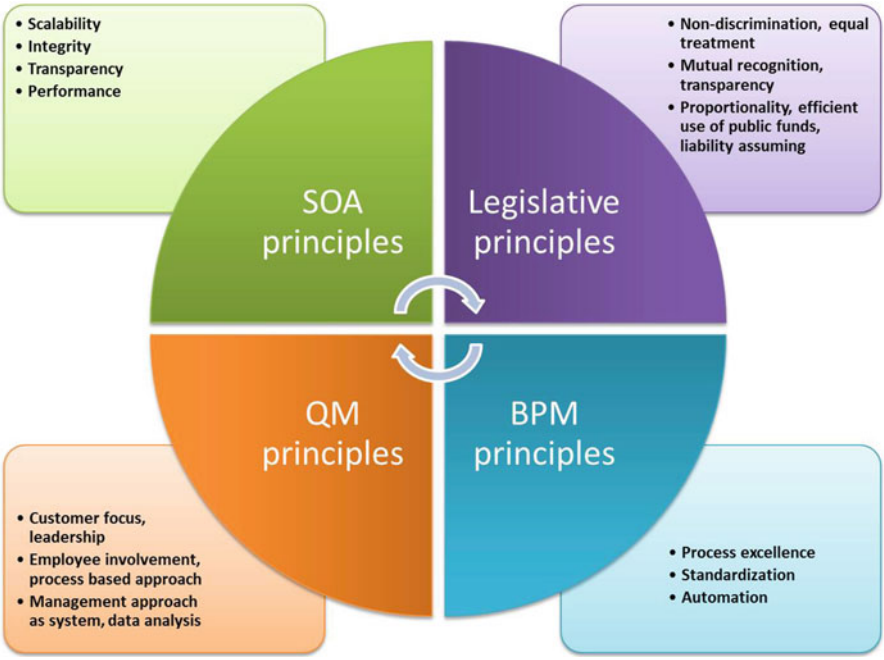


Fig. 7.9 Examples of principles underlying an agile procurement process

The proposed architecture includes modern technological solutions (SOA, Cloud Computing, BPM, BR, Knowledge Management, BI) that will lead to achieving government objectives (in general) and public institutions objectives (in particular): (1) increased savings; (2) increased quality of provided services/goods/works; (3) increased capitalization of opportunities in procurement process. The architectural solution must be built in such a way that it is based on a series of principles, like: legislative principles, SOA principles, BPM principles and principles of quality management (QM), in order to improve the procurement process and increase its agility (Fig. 7.9).

An agile architecture, oriented on services may provide numerous benefits to the public procurement system, allowing a reduced complexity and increased flexibility of business processes. In order to meet the increased organizational needs, quality standards and increased funding available to public institutions, the architecture must integrate specific informatics systems like Business Intelligence for Procurement. A combined use of BPM and BR with SOA and BI leads to agility and efficiency.

The use of ICT (Information and Communication Technology) must not be a purpose by itself, but must be aligned to institution/government strategy. ICT solutions used in the procurement process must be permanently adapted to current legislation, recommendations of legit bodies, management of procurement risk,

internal procedures and quality management policy. Additionally, creation of an infrastructure that combines SOA and BPM principles, quality management and legislative principles leads to operational efficiency and agility in public procurement process.

There are frequent changes in public procurement, especially due to permanent changes in legislation. Also, there are integration and interoperability issues due to market size and the need to use different IT platforms/solutions on government level. Government applications are not easy to change over time because many times the business logic is buried deep in the system.

SOA is recognized by researchers and practitioners as an architecture that provides flexibility to frequent market changes. SOA allows decoupling, extraction, migration combination and reuse of software components to implement and support public sector procedures and flows [7]. Also, SOA allows separation of data from processes and user interface. Additionally, SOA provides interoperability and reuse of various software components that can be executed on different platforms.

In public procurement process, the operations of each involved party may be exposed as web services in a service oriented architecture. Orchestration and choreography may be used to provide an open approach, standardized to connect web services in order to create high level business processes [8]. Sustainability and advantages of SOA in e-government process, and especially in e-procurement, are recognized both by researchers and practitioners, SOA being used more and more in e-government processes.

Cloud Computing: With ever increasing ICT demands and limited resources, Cloud Computing offers a new model of providing, on demand, common configurable computation resources. Even if Cloud Computing is best suited for small and medium organizations, the solution may be successfully used in creating a national level agile architecture for public procurement services. Use of cloud computing solutions requires rigorous analysis of institutional necessities and selection of those service models (IaaS—Infrastructure as a Service, PaaS—Platform as a Service, SaaS—Software as a Service) and development models (private cloud, community cloud, public cloud, hybrid cloud) that lead to achieving government objectives.

The large volume of data processed on national level makes the use of cloud computing advisable for storing data. Migration of data, services and processes to cloud platform must be performed based on well-defined models/strategies. Each migration model has specific objectives to be achieved, according to organization policies, information control and security [9]. Infrastructures, security characteristics, norms, rules and policies are critical elements of the most successful e-procurement solutions based on cloud [10].

BPM is frequently used in government solutions, being recognized as having an important role in collecting data related to electronic government systems, simplification of complex processes, automation and optimization of work flows. Also, BPM is a central element of service oriented application development [11]. Thus, each business process is modelled as a set of tasks individually processed, implemented as services. SOA exposes the services and BPM helps automate the process, by calling the services. The combination of SOA, cloud computing and

BPM may generate a synergic construction to ensure the success in implementing agile eProcurement systems.

In order to have a dynamic system, that answers quickly to frequent changes, mainly of legislative nature, system reengineering must be performed without major changes in implementation, instead modifying (where possible) the business rules. **BR** are used more and more in development of informatics systems, providing flexibility and adaptability to internal and external changes of the environment. It is important to use BR in an agile architecture because [12]: they can be reused, allows fast changes in the system, support making decisions in real time.

In order to provide flexibility in implementation remodeling, business rules will be described in separate modules. According to [13], business logic implementation in separate modules leads to big advantages, like:

- It is well designed and the business logic module is transparent to business users;
- It allows adaptation of business rules to frequent changes;
- It reduces duplicates, meaning that if the IT department decides to change an ETL (Extract, Transform and Load) or BI instrument, business rules implementation does not change;
- It allows inter-functionality, large scale IT usability and business rules management.

Additionally, many times one only needs to change the processes or business rules. For example, there may be new regulations or business strategies that modify only the business rules, without requiring changes in the business processes (changing the minimum threshold for some procurement procedures, for example). Also, there are situations where changes in system implementation are required (like changing the work flows), which do not involve changes on business rules. In both cases, separation of business rules helps a faster implementation of changes in the system. Modelling the business rules on various levels of abstraction may be achieved by integrating a BRM (Business Rule Management) module in the public procurement architecture.

The public procurement system involves the existence of a large volume of data that must be analyzed in order to increase the system efficiency. The analysis of large volumes of data regarding expenses from public money, calculation of performance indicators, evaluation and classification of offers, management of public procurement contracts and procedures lead to the need to use a specific G2B electronic government BI solution. The BI solution must provide procurement features, like: forecasts of future needs and required quantities, evaluation of persons in charge of procedures and finding indicators to measure the efficiency of using public funds, evaluation of providers, and calculation of performance indicators.

The features of BI in public procurement may be grouped in three categories (Fig. 7.10): intelligent procurement (extraction of information about providers, contract object—goods/services/works, procurement activities, support for making intelligent decisions), portfolio management (practices/templates for sale, demand forecasts, centralization and management of procurement plans) and performance

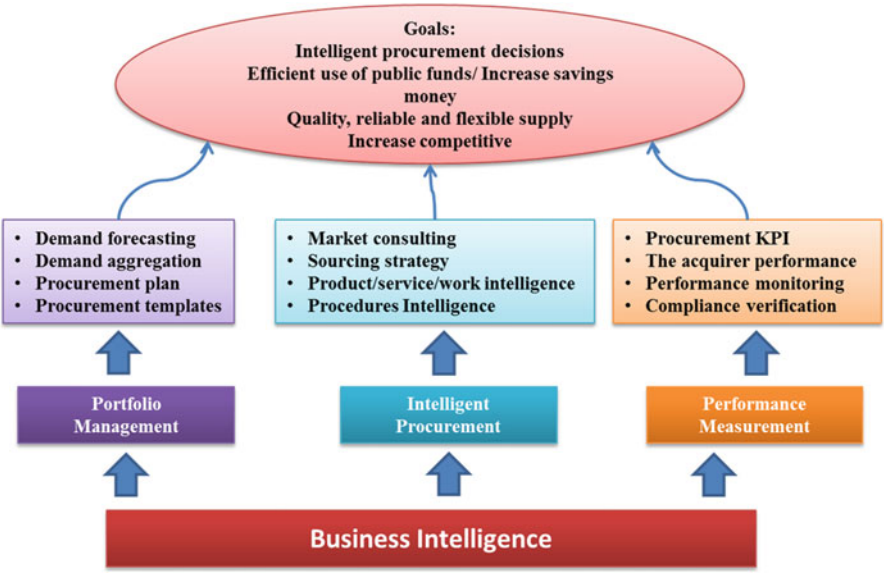


Fig. 7.10 Overview of business intelligence components for public procurement

management (procurement monitoring, verification pf compliance to legislation, measure the efficiency of procurement, compute performance for buyer) [14].

In order to combine business processes with business rules, BI and SOA, a modelling stage is required before creation of the system. In this stage public procurement elements must be described in a structured or formalized manner. In this stage business rules that govern business processes must be analyzed. Mircea and Andreescu [15] presents a case study in public procurement that showcases the use of BI, BR and SOA as support to achieve organization goals. The paper highlights the links between BR and BI, presents BR patterns, and stages of creating a public procurement dedicated BI: (a) Identify Goals; (b) Identify performance quantitative indicators for public Acquisitions; (c) Describe each indicator as a completely specified business rule; (d) Publish business rules service.

The knowledge based society leads to challenges in using knowledge as key factor in achieving business competitiveness. An important role goes to Knowledge Management. A knowledge base in Romanian public procurement has been accumulating (Fig. 7.11) in recent years on national level, representing important sources for making intelligent decisions on G2B market. The knowledge base consists both of explicit knowledge (easy to manage, consisting of documents, data bases, used to make decisions) and silent knowledge.

In public procurement explicit knowledge include mainly legislative regulation regarding public procurement and norms for application of legislation. Also, in order to increase efficiency, good practices and procedures must be recorded. Silent knowledge, which belongs to persons involved in public procurement and their

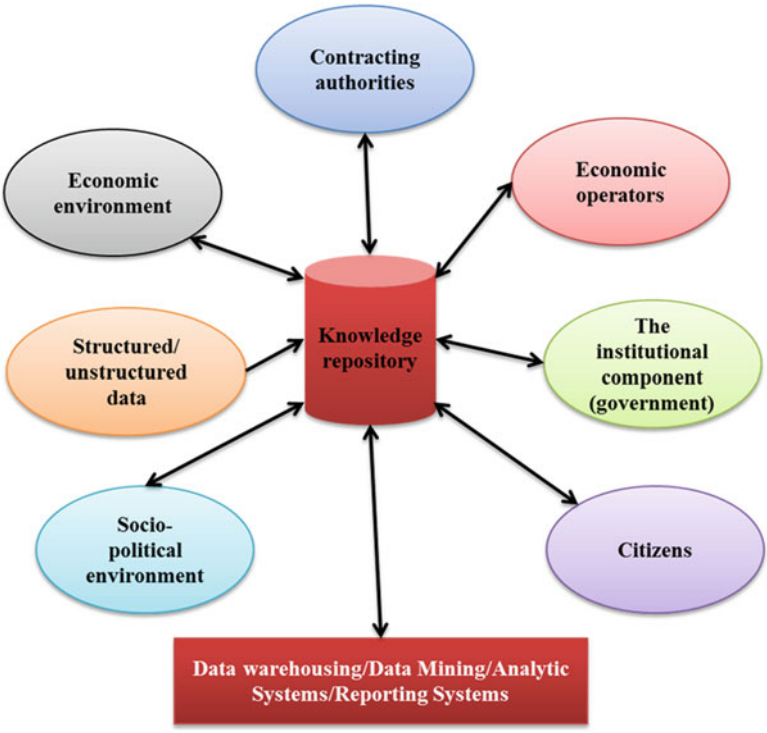


Fig. 7.11 Knowledge management system

experience in this field are hard to define and transfer. The experience, qualifications and competencies of buyers may be obtained during recruitment phase [16].

An agile architecture for public procurement must allow for adaptability to policies and legal regulations ensure the link between parties involved in procurement and interoperability with their systems. It must include systems, hardware and data that allow changes in public procurement processes. Starting from the technological solutions discussed above, Fig. 7.12 presents an example of combining them in order to create an agile architecture for public procurement process.

Creating and using an agile architecture for public procurement process does not guarantee its success. The success of public procurement depends on a series of factors like: IT infrastructure quality, size of organization culture, knowledge management, quality of structural, processual and functional organization, quality in organization and management, quality in system and technology etc. All these factors are very well detailed in [17].

Building a successful and performant public procurement system is a vital element in the development of G2B and achieving economic capitalization on national and international level. The approach must be exhaustive, regarding the three dimensions of the enterprise architecture: business architecture, technological architecture and informational architecture.

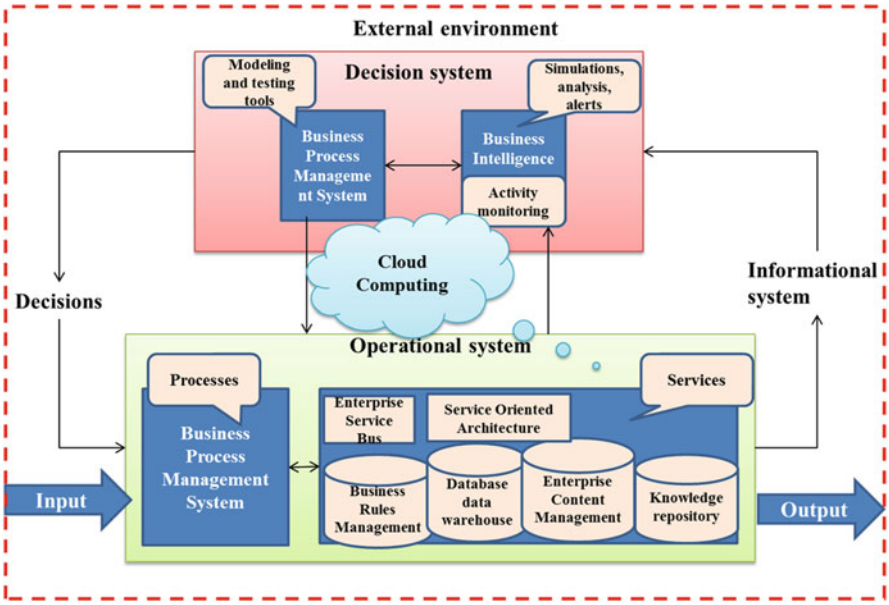


Fig. 7.12 Agile architecture for eProcurement system

4 Conclusions

This chapter is the result of significant experience accumulated by the authors in Romanian public procurement and specific information technologies for development of agile architectures and systems. Beyond the current state of public procurement in our country, in this chapter we have synthetized the research directions and proposed solutions to improve general public procurement systems, with focus on Romanian system. Even the Romanian authorities, represented by authorized institutions, admitted that the Romanian electronic public procurement system (SEAP) is not complete and fully compliant to the legislation at the time this case study was elaborated. This is why, starting with August 2016, a new electronic system for public procurement it was released in 2017 May for testing and general use. The new system, at least on declarative level and design specifications (at this time the platform is available at http://sicap.e-licitatie.ro/pub), provides real features for full unfolding of electronic public procurement.

We must also note that Romanian legislation in public procurement was updated and aligned with the European one, which again calls for a change in the approach towards eProcurement. The European trend is to simplify the norms, procedures and methodologies used for public procurement. This is a result of the relatively low absorption of European funds in the member state (especially the newest members). Without even touching the aspects of European policies in public procurement, we must note that one of the European Union goals is to promote investments in

countries that became members after 2003 (among which is Romania, member since January 1, 2007). Investments require procurement, and when the funds come from the European Union (therefore are public funds) public procurement is recommended. Beyond these aspects, the main reason for the frequent changes in public procurement is the drive to make procedures more transparent. Unfortunately, too much desire for transparency may easily lead to breaking the principles of public procurement (equal treatment, non-discrimination, proportionality, efficiency in spending public funds etc.).

Avoiding such mistakes may be achieved by implementing electronic public procurement systems based on agile, safe and performant technologies. From this perspective, this chapter proposes this kind of solutions, using specific elements of BPM, BRM, KM, BI, SOA and Cloud Computing. Proposing this architecture for general e-business systems, but customized for eProcurement, comes from accumulated experience, including system problems that we faced during public procurement procedures. Even more, this proposal envisages a fully electronic public procurement process, from drafting the procurement documentation to unfolding the procurement contract, including specific features for contract management, order and bill management and electronic payment through eBanking means.

This chapter may be a beginning of a "state of the art" of public procurement in Romania, built on the current SEAP, with high expectations from the new SICAP. The research may be continued with evaluation of the new Romanian e-procurement solution from the perspective of the proposed agile architecture and the extent to which SICAP provides participants to public procurement process with opportunities to capitalize and exploit the success factors identified in this case study.

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