# The Development of Citizen Oriented Informatics

Ion IVAN, Leonard SĂCUIU, Daniel MILODIN, Mihai GEORGESCU
Academy of Economic Studies, Bucharest, Romania
ionivan@ase.ro, leo.sacuiu@gmail.co, daniel.milodin@ase.ro, mihaita.georgescu@gmail.com

*We define the concept of citizen-oriented computer application. Quality characteristics are set for computer applications developed in the conditions of citizen-oriented computing and outline the development cycle for these applications. It defines the conditions of existence for citizen-oriented applications. Average and long-term strategies are elaborated.*
***Keywords:*** *Distributed Applications, Metrics, Citizen-Orientation, Strategies*

## 1 Citizen-Oriented Computing Applications

Internet as a large network of computers has grown every year in making the explosive pace of information technology citizen oriented. Tangible achievements have won a few years, in reducing the prices of personal computers and growth performance. Infrastructure based on optical fiber has become a utility, and wireless communications have expanded the possibilities of internet access of citizens in various locations: on the streets, in hotels, in parks, cafes.

Citizen-oriented computing applications:

- contain automatic unsupervised processing, input data is entered only by people in society and performers from organizations without requiring knowledge of computer science;
- selection of management options by persons with decision role, resulted in the selection of variants and signing the decided upon variant;
- information from databases generated activities within organizations, making customized products and services offered to those who have requested them;
- any application is open to all citizens, stores information, and using robotic systems to produce exactly what is required in the needed quantity; unique models get the same features as mass production.

Computer-oriented citizen within manufacturing custom property includes:

- collecting data to define the people;
- creating custom template in no time;
- adapting robotic equipment for the production of customized goods.

Benefits to the citizen are:

- product is made according to his wish, being perfectly adapted to its needs;
- low acquisition cost due to automated data reception and processing and robotic production systems that allow easy customization;
- timely delivery, an important criterion of choice of providers; application integration, production and distribution of products in this new vision, leading to optimize the entire production process and delivery;
- quality is guaranteed by implementing quality control systems, automation and manufacturing processes ensuring automation to each personalized product quality;
- customizing products by labeling them with texts by changes in form, shape and / or color combination.

At the organizational level, the following advantages are based on the principle of personalization products:

- time adjusting production parameters as for other large series production;
- process duration does not change;
- linear organization schema, easier to manage the organization;
- making a product in a time comparable to that achieved by mass production;
- achieve a definite result in the sale of its product to the citizen who requested the customized product.

Characteristics of mass production are:

- a template that is used for all products;
- a single adjustment of equipment depending on customer demand;
- make products using the same recipe, same pattern, same equipment, same material;
- maximum productivity is achieved, the maximum production volume, maximum quality, cost control to a minimum.

Structure for a sporadic production process involves a minimum of operations as follows:

- training period, consists of preparing and delivering times the operations required by the citizen data and information necessary for personalization product, adjustment of production patterns and systems in accordance with the data submitted by the public, is the most laborious stage to ensure product quality ;
- implementation period, consists of operations that constitute the process of product development, it is added to ensure quality control;
- sale time is minimal, because the product already has a buyer.

Citizen oriented applications must ensure optimization of products delivery. Integrating functionality into the application delivery optimization is a necessity. Customer satisfaction depends on the desired product including time of receipt, in terms of quality and safety unaltered. Through the delivery optimization module the following become automatic:

- containerization, in the same container the products that are optimized for transmission on the same route;
- optimal loading of the container, the application of the stack, the first product delivered - the last items loaded;
- transport.

Benefits arising from the implementation of citizen-oriented applications are:

- the decrease customer waiting time and create custom craft production;
- shop restructuring decreases whereas their role in marketing;
- replacing traditional buyers with mobile ones that are working with the 3D scanners.

With the development of citizen-oriented applications craftsmen role is decreasing. To remain on the market they must:

- accept online orders made by customers based on scans;
- produce something special, even unique for which no patterns exist;
- have production costs and lower sales costs implicitly;
- work quickly;
- make handmade products.

Currently a problem is identified, a software producer is identified, and the development cycle is followed as in [1]:

- problem definition;
- specification development, environmental investigation of the existing economic system options;
- solution development;
- writing code;
- test;
- documentation preparation;
- implementation;
- maintenance.

The problem definition stage is meant to identify its characteristics and operation of the software to be implemented.

Design specification for the task includes identifying the requirements the product must meet. It also involves analysis of the problem for which the product is built to determine directions for improvement. At this stage the customer is active, because he holds the best knowledge of the context and purpose to be achieved. At first carrying out a comprehensive study on the activities and information flows and the volume of information to be processed by software is done.

Developing the solution lies in the development stages of optimization algorithms based on identified specifications, [1].

Writing code is using methods, tools and work processes. The instruments used are means writing code that is used by the team of software developers for product

development. Using these tools in software design is performed in accordance with a set of principles and methodologies which shall be adopted according to the actual situation to which it relates, [3].

For testing, each project must contain a detailed plan that includes all the functionality of the software and ensure proper execution of the entire product. Testing strategies focus on product functionality and usability. Testing involves testing software components, functions or classes of functions, as a test plan that includes all test cases, [6]. The complexity of testing increases for products with functional ingredients interlinked because dependencies between modules.

Implementation of product installation includes all operations required in a real working environment.

Stage documentation should provide specific information to use. The types of documents that must accompany the software are:

- specification, describes the product;
- information for classification, retrieval refers to the way the software libraries;
- declarative information, which specifies the conditions for change events and product status;
- about quality documents and certificates, including complexity metrics, reliability, mechanisms for solving problems of product;
- information on use, instructions, references to the system is included;
- detailed documentation refers to input / output interface hardware and software requirements, user's manual.

Maintenance software is a specific process designed to run on a long interval, it means more than three years. In time, due to development processes, changes in legislation, structural changes are necessary to adapt the software community in a way that to meet real user requirements.

Citizen oriented informatics assumes that the user is subject to obtaining inputs for the organization. Solutions are needed to ensure a high level of data quality, requiring the certification steps of input data [2]. The user is the organization and the citizen has no role. In these applications:

- operators enter data;
- quality is oriented towards the organization which is the beneficiary;
- citizens receive outputs from the application;
- authenticated citizens enter data, but the results are produced how does the organization desire.

The target group is defined as a set of people who have a particular need that can be served through the application:

- **number of persons,** an important factor determining the feasibility of the application, if an application for calculating the number of persons constituting the duties of the target group is the whole working population of a country, similarly to the application for obtaining the license, considering a shoe manufacturer, the target group is composed of the number of people wishing to purchase certain brands, using personalized digital means, to estimate the size of the target group is made by extrapolating the proportion of people who have purchased through traditional means, that mark the a country's active population in the digital environment.
- **structure** refers to the proportion of women and men, young-elderly, the proportion of those with lower incomes and above average for most of the time structure of the target group is identified with the target market segment, noting that financial matters bearing on the intentions of users use computer software made available;
- **characteristics of the group** refer to professional qualification, age, work on computer skills, influencing decisions are taken by application development team, dexterity in using the computer to determines the potential customers using a simple graphic interface design, without much supporting indications to complete operations required, skills and awareness does not necessarily mean

validation relaxation elements of input data and intermediate steps in completing a transaction, data validation and processing of intermediate steps ensure consistency and integrity of data, the proportion of elderly people or with certain diseases that can affect the user experience of the application, typically entails the use of accessibility technologies.

Sample size is determined based on estimates. It identifies the issues that people who make up the target group and want to solve them online. It starts by defining the problems of citizens and not the organization. The draft specifications from the requirements of citizens and the organization owning the software application is actually providing services to citizens. Benefits result as a percent of its apparent advantages to citizens. The development cycle of citizen oriented applications includes:

- defining the target group;
- defining the issue for the target group;
- specification development to satisfy the target group;
- solution to produce economic development and satisfaction of the target group;
- development code to allow processing and data acquisition of different sets of people without operators;
- testing application to be accurate, rapid;
- implementation for the citizen;
- assisting citizens and debugging in real time;
- development of friendly interfaces;
- ensure continuity of structures and vocabulary dedicated interfaces.

The whole process of development of these types applications should always go with the idea that the user is not a specialist in computer science, therefore the application interface must be intuitive, error-free or expressions that refer to concepts familiar to a small circle of dedicated people. This objective is difficult because an experienced computer user inferred from the use of application context and the know-how is difficult to implement.

## 2 Quality Characteristics of Citizen-Oriented Computer Applications

Unlike traditional computer applications in the organization owning, but the developer accepts the quality of a distributed computing applications as all the characteristics of technical, economic and social citizen-oriented computer applications, quality is a new content as these applications are considered good according degree of satisfaction offered citizens [5].

Citizens are not mere users of computer application in that it dictates the operator or identifying elements and variable fields to trigger some purchases, payment or performance of services, testing, documentation, architecture projects, [5]. In the new context created, citizens:

- enter data;
- trigger selected actions;
- trigger processes;
- ensures management.

Therefore, applications-oriented information citizen must:

- easy to understand interface to allow direct access mode;
- minimum flows or with very few selections to achieve what he has to do;
- maximize the degree of reuse of data, on the principle enter the code numbers and all data are obtained.

Philosophy of these applications focus on the needs and concerns of citizens, involves features that should be considered throughout the lifecycle of IT application.

**Functionality** is based on a set of specific functions and their properties. They satisfy stated or implied needs. Software is functional if you make changes leading to the quantitative and qualitative results that correspond to product specifications. Evaluation of functionality is achieved by successive testing of the software group involving citizens and Target checks the source text and associated components. The regular citizen, the user of the application is very critical in relation to

assessing its functionality. If he has doubts about the functionality he will probably not use the application. Functionality transpires through every element of the interface and means of interaction with citizens. Thus, every operation undertaken by the user must be strictly necessary, redundant set of operations is reduced. Session history must be exploited fully open in order to customize a user interface that the user interacts with.

**Usability** appreciates the effort required to estimate the individual use and use by a target user group. Ensuring usability plays an essential role of the citizen's point of view representing the end user rather than developer's point of view. An average user may have a different perception from that of a specialized user. Once again, therefore need to customize the user experience. Some users are using with increasing frequency over certain operations that must be accessible, based on default settings chosen by the user. But access to less frequently used operations should not be placed in the background in terms of user effort. We mention here the dashboard concept to achieve the application interface as a way to ensure easy and clear access to application functionality.

**Efficiency** refers to the relationship between the level of product performance and quantity of resources used under specified conditions. A software product is effective when there is a balance between resources spent and the complexity of the problem is resolved. The financial effort being put on the citizen by using the software to be correlated with the satisfaction they offer. Also, the hardware and software necessary to use product out of reach of citizen media computers as performance criteria, the popular software with no restrictions on Internet speed connection. It should be noted that in some cases above average income users prefer experience using easy, effective at the expense of a slightly higher financial cost.

**Reliability** refers to the software's ability to maintain its level of performance under specified conditions for a given period of time or the likelihood of an interruption in the execution of the product under the same conditions of use. Reliability is a key feature because the software that has defects in execution cannot be used. It highlights the behavior of software, namely, fault tolerance. Estimation of reliability is achieved through direct measurement or based on information related to product development. Non-reliability concerns effects that have impact on the implementation of the citizen and the amount of compensation which the organization has to offer. In the old non-reliability approach see the effect on the owner's application. Now the owner is to serve the citizens. He has gains interest from citizens and is charged by unsatisfied citizens.

**Maintainability** is based on a set of indicators measuring the effort required to make specified changes. A product is maintainable if it offers quick and easy upgrade, aimed at achieving better conditions processing functions and implementation of new processing functions. Maintainability is influenced by the design, implementation and testing. Citizen oriented informatics requires increased maintainability to meet diversified demands of changing / adding services. If the organization does not respond affirmatively within a reasonable time, normally in a competitive economic environment, the citizen will go to competition to solve problems.

**Portability** is a feature that considers the software's ability to run without changes on different hardware platforms and software. The organization cannot require citizens to use a certain platform hardware / software. If, however, do need to take some negative consequences arising from the straightening of a part of the target group to other software products that are less restrictive in this regard.

Social characteristics are manifested through the effects caused by the product in large communities of users by their role in addressing the needs. These characteristics are reflected in the efforts being made to ensure that users get used to its specific mode

and extent to which the program meets expectations.
Software product quality is influenced by the quality of input data. The extent to which it responds or not to citizens' needs can be assessed without taking into account the completeness, accuracy of data entry, duplication and comparability.

## 3 Computer Application Development Cycle Oriented Citizen

Current software technology, through the performance of programs available to the developer, allow the development of flexible products in terms of high quality and low purchase price, a trend reinforced by the competitive software market.
The development cycle of citizen oriented applications has the following stages:
**$E_1$. Defining the target group** is the stage which is done based on the field of activity. Thus for a bank type organization, the citizen is the one who present himself at the bank office. In an online store, the citizen is a regular customer, who accesses the product catalog and makes buy products. At the office of Financial Administration, the citizen presents himself for making the payment from the annual tax package. At the insurance company, the citizen presents himself for insuring a good. Therefore, in designing software products, all it must start from the premise that the citizen is not a computer science specialist, his experience and openness to the possibilities of information are very different from one another. Citizen interest is to solve a problem quickly, easily and safely. Citizens should not be put to read the full product documentation in order to solve the problem because he will not trust anymore the chosen solution and ultimately the application will not be used.
**$E_2$. Defining the problem to be solved** for the target group is at the center of attention by its needs. Defining these needs ensures the complete product success. The target group is the group of users who wish to make use of software to solve their current problems, such as banking portfolio access, on-line payments and on-line acquisitions, property insurance. The analyst defines the target group of citizens who wish to satisfy the current need for a single virtual environment, such as electronic payments to providers of public utilities. Sure that users who are using these tools month by month, will wish to diversify their online operations. Having this in mind, the integration of applications which seeks to increase the target group may become feasible. We are dealing with a decision taken by the software developer's business strategy.
**$E_3$. Specification development to satisfy the target group criteria** is an important step in product development cycle, being the premises for the implementation team. The analysis team will focus on developing product specifications taking into account the program's defining characteristics of an ordinary citizen and that he has no time to read the full documentation and wants to solve a problem quickly and safely. Also must be considered a range of user's disabilities, such as: vision problems, difficulty in accessing equipment that allows data entry, and other various disabilities. Product specification must capture all of the citizens defined by the target group stage, which will use the application, because in the end, the frequent user must become effective in a short time.
**$E_4$. Solution development which produces savings and satisfaction for the target group,** ultimately wants to provide access to application's functionalities in a form which is attractive and easy to use. The proposed solution will provide a sensible citizen interaction between the user and software interface. Must be taken into account that the purpose of the application, is to reduce the waiting time from the moment that an operation is triggered, until when a resolution is given to the user who requested. The attitude towards the citizen is required to be respectful. The denial of an operation must be done in polite terms, explicitly describing the case. No suspicions must exist over product's quality, the algorithms or the technical solutions implemented. The

population records system must use the personal identification number as a key in user retrieval processes. The software platform must allow the use of keys retrieval of various types of spelling and use of diacritical marks. The citizen should be encouraged and guided to the use of secure passwords. The process of retrieving useful information for the citizen is required to be flexible with opportunities of small variations for search criteria, allowing the return to the previous steps without losing the selected subset at a time.

**$E_5$. Coding and development of technological solutions** based on an analysis of requirements to ensure the comfort of citizens. Therefore, transactions with a small amount of data as input are considered. The use of selections with one or more options, predefined lists, completing a minimum number of text fields and excluding those that require a large number of characters typed is preferred. The interface customization and the initial values of fields based on information previously circulated particularization are wanted. In the case of introduction of larger data volumes, it is required the citizen awareness about the importance of this operation, to ensure the accuracy of data input. It is preferable that the data once retrieved can be reused any time they are needed after the input process.

**$E_6$. The testing** is done in the following steps:

- at the developer with random data sets;
- using sample target group, the sample is built on the structure of the target group and must be representative; the sampled individuals must use the product to solve the problem of interest, if an overwhelming percentage of them appreciates it, as being positive, providing suggestions for improvement, the product may be declared feasible.

The application must be accurate and quick.

**$E_7$. Citizen implementation** involves creating an effective product based on the requirements of the citizen. Thus, the usefulness of human operators disappears. Instead, the need of system administrators remain, their role being to keep the whole system into service within normal parameters, being able to keep the database updated and achieve all input and flow correct processing. System's downtime must be kept as short as possible to not affect the citizen.

**$E_8$. Helping citizens and debugging in real time** to prevent and treat situations which impede the proper functioning of the product. However, these situations can occur for various reasons, such as:

- exceptional situations that are not part of the statements provided by the team of analysts;
- initial data entry satisfy the criteria for validation, but the complete set of data is affected by inconsistencies;
- hardware failure of user's equipment or of application's provider;
- Internet service provider.

Software administrator should provide easy ways of contacting for users in order to identify problems and emergencies. The existence of a call center must be considered which takes the situations only through the intervention of a consultant. The situations within a common set of operating errors are fixed through the directions given by the operator to the online resources well managed and updated.

**$E_9$. Making friendly interfaces and ensuring the continuity of structures and vocabulary interface dedicated** to providing a favorable impact on the citizen interface program product as in the perception of the product program affects its life cycle. Create a user familiar environment is beneficial to eliminate some possible frustration, [10]. Negative experiences of the user should be improved by using intuitive interface elements that appeal to his common sense. Dedicated interface elements should be used even if it creates a general leveling landscape aesthetics, [9].

Pragmatism should be promoted, the citizen would solve the problem. It would actually design and implementation of elements of evidence. The design will be such that the

average citizen to make a minimal effort to resolve the problem.

## 4 Types of Citizen-Oriented Computing Applications

Applications integrated computer database to solve a problem involving the citizen's social security number provided, and its owner on the application will access all necessary databases to solve the problem without paying the owners to force a citizen to the financial efforts.

**Old version:** To make a bank account, the citizen goes to the bank with all sorts of documents and money, an approach that involves the waste of resources. Citizen moving to a branch bank, possibly the head office, fill out forms, submit them to documents desk and return to headquarters to find out the answer to the request.

**New version:** the approach is completely different, radically altering bringing benefits to citizens. The personal code is presented to the bank and states what type of account is desired. The bank access the population database, the database of diplomas, the IRS database, the database of employment of citizens and building a record score against which creates an account.

Considering an application for enrollment in college, after the personal number introduction, a process of the application accesses the databases necessary to identify the candidate's educational history, educational institutions completed, marks obtained in Class I-IV, middle and high school. Candidate's personal information such as address, name of father, marital status data are retrieved from the public filing system. The candidate completed only contact details, telephone and e-mail.

The flow of operations for the application to obtain license on public roads, as citizen-oriented application:

a. citizen enter the personal identification number;
b. software accesses the database of public records and completed application form with data taken from this database, including images of the citizen;
c. citizen verify form data, and if they are correct, agrees to move to the next step;
d. an appointment is suggested citizen psychological evaluation;
e. after the positive assessment, application and re recovers citizen's identity number to receive a written test appointment;
f. if you passed the written examination, also based on the personal number will get an appointment to assess the route;
g. if the last step before a new entry into the online system will pay fees for issuance of license;
h. that payment has been accepted will receive a driver's license by mail with acknowledgment of receipt.

Considering the citizen-oriented application that involves the provision of data resulting from measurement processes, products and applications for control of footwear, clothing, the flow of operations can be:

a. person goes to a center of 3D scanning;
b. apply the process of scanning and measuring the dimensions necessary for ordering a product online that you want;
c. resulting information is entered into a database and is given an identification key;
d. individual software application accesses a shoe manufacturer;
e. choose the design, material, plus the price and the term for the mode of transport;
f. giving order to identify key scanning and its coordinates;
g. pay online;
h. a certain number of days after receiving the product;
i. if the product meets the requirements, it can be returned free of charge after contacting the manufacturer detailing the problem occurred;
j. the person receives additional details about receiving the product complies with its requirements.

It is important to make very precise measurements after the procedure. The citizen goes online on the Internet, completes data measurements, fabric choice and automatically the software calculates the price to be paid and your computer has all the

necessary data for ordering. It is very important that measurements are correct for measurement errors that cannot be attributed to the manufacturer. The manufacturer may refuse to return a product that does not meet the citizen as a result of measurement errors.
The same data are used for remote diagnosis. There are devices for measuring heart rate, blood pressure, public computerized tomography, and the data is transmitted via the Internet specialists.
In defining the flow of operations submitted to be considered a benefit in behalf of citizens, such as:

- decreasing the effort of typing by remembering lists of codes;
- data and transaction security;
- confidentiality of personal information used, additional conditions imposed by law on the management of personal data;
- the flexibility to cover emergency situations that some users may have an unusually large shoe, the opportunity to enroll in college in old age or too young;
- algorithms used, the processes of trading and system redundancy to ensure full completion or refusal of the working conditions of fairness;
- it is necessary to store information defining the successive states through which an application goes.

Social citizen oriented applications, allow the assertion of his desire, by providing information and opportunities to support the moral, financial, charity events, various social causes, by implication any geographic area in which citizens operate. Internet environment offers an impressive capacity to penetrate the consciousness through such applications, which allow each citizen to take action to save lives. Application designed to promote STOP CANCER campaign aims to form a current of opinion favorable to raise money to build a treatment center for children with cancer. The campaign is promoted through the use of a national computer application which makes financial savings by lowering costs of making of the application, informing a large number of people willing to support the campaign, providing operational information quickly and efficiently and disseminating news. The flow of operations is available to citizens:

- opting for regional settings, select the Romanian language or English, by spreading the campaign message to as many international languages increases the magnitude campaign;
- aims to inform the campaign through text messages, audio and video;
- express moral support for the objectives of the campaign, by inclusion in the campaign database;
- donates money to support the campaign financially;
- is informed of campaign events.

This kind of approach brings a completely new relationship between citizens and public or private organizations. Behavioral changes are required in the organizations but especially in terms of citizen's social behavior. Citizens will influence economic and social dynamics, which place him it in the center of society, something unprecedented in the history of society.

## 5 Medium and Long Term Strategies

The industrial revolution of past centuries was based on steam power, the power of man's physical and monetary capital. The richness and power of our century will be derived mainly from intangible intellectual resources of knowledge capital. Knowledge revolution, i.e. the transition to knowledge-based economy, is a comprehensive process that generates changes in all components of economic activity.
Profound changes occurring in the economy, firms and knowledge management should be reflected in new approaches to the organization's strategy. Such skills are important resources of the organization and the organization's ability to learn is very important. Therefore the organization came up with products / services such knowledge in the general context of continuous innovation.
Medium term strategy states:

- classification of problem types citizens encounter;

- creating the infrastructure to allow citizens access to information resources in distributed applications;
- bring benefits to citizens solve their problems by accessing computer applications;
- applications monitors user behavior, and in case of frequent errors, an application maintenance team is activated to ensure the elimination procedure generates errors as appropriate implementation and application processing.

By monitoring access to the application to determine customer satisfaction index, a ratio of the form:

$$ISC = \frac{A}{B}$$

where:

$A$ – number of people entering the application and complete the necessary operations to obtain desired product or service;

$B$ – number of people using the application.

$$B = A + C$$

where:

C – the number of people dissatisfied due to application errors, that does not fully solve the problem of the citizen.

Clearly the value of an index of satisfaction is difficult to achieve. An STI value between 0.85 and 0.99 brings satisfaction to the client and development team, implementing application-oriented citizen fulfilling the goal. The application is used extensively because of perceived problems with incorrect or sometimes on some aspects of the operations required to be made by the customer or the emergence of enough exceptions handled by the implementation team. The impact this has on the satisfaction index is reduced by providing resources needed to implement a customer service assistant. Values under 0.7 bring significant doubts on the validity of the application.

Long-term strategy aimed at:

- increase the diversity of ways of acquiring personal data from citizens;
- generalization of the allocation of resources through accessing distributed applications, such as those made reservations for tickets;
- work under the plan, now every organization has its own software, the future is to rent a server and access it and use accounting software to solve problems, the database is proprietary to the organization or application, is seeking the elimination of paper including official documents, a stranger has a card, e-mail and web space.

At EU level there is concern evidenced by the *eEurope* program that promotes information technology as a support level of growth and quality of life of citizens. Strategy approach, according to the *i2010* program, addresses the objectives:

- creating a single European information space;
- Research, innovation and investment in information technology;
- information technology in support of citizen inclusion in society, better public services and improving the quality of life;
- analyze the economic, social, technological and legal digital user-generated content, citizen of the European Union;
- achieving a single market for information society and media.

The European Union proposed a list of public services that are recommended to be included in the services provided to citizens and businesses through distributed computing applications. In these recommendations and indicated degrees of complexity of these distributed applications:

- Information level: dissemination of information about existing public services;
- unidirectional interaction: basic form download requests from the national to the organizations;
- bi-directional interaction: the on-line form, processing and making requests to do is to use authentication mechanisms;
- transactions: the transmission of information, decision making and delivery, including electronic payments.

List of basic public services proposed by the European Community to be part of the

services offered via electronic means, to e-government, is as follows, [9] [10]

- income taxes: declaration, notification;
- services to search for a job through employment offices;
- social security contributions, unemployment compensation provided to deductions for children, medical costs, scholarships for students;
- personal documents, passports and drivers licenses;
- car registration;
- applications for building permits;
- statements to the police;
- public libraries, availability of catalogs, search tools;
- civil status registers;
- enrollment in universities / colleges;
- announcement of change of address;
- health-related services, interactive tips on the availability of services in different hospitals, medical examination appointment;

To achieve the electronic interaction between Government and business, the European Union has proposed a set of basic public services, which must be provided to business and by electronic means:

- Social contribution for employees;
- organizations tax: declaration, notification;
- VAT: declaration, notification;
- register a new organization;
- transmission of data to statistical offices;
- customs declarations;
- environmental permits;
- public e-procurement.

The Internet is today a fact of life. EU statistics show that one in two Europeans use the Internet regularly and 80% of households with Internet access have migrated from dial telephone call-up to broadband access, users of increasingly Moreover, new applications.

## 6 Conclusions

The transition from the classical-oriented computing is a national necessity involving new technologies, new metrics, another level of equipment and good software. Techniques and new methods of analysis, design, implementation and testing of computer applications will develop new ways of presentation, filtering and data protection that puts the citizen and his problems at the heart of providers of products and services. The use of citizen-oriented applications benefits citizens. In order to meet their daily needs citizens are interested in using citizen-oriented applications. Regular citizens can pay taxes, submit applications and notifications to local and central government, ordering online at home culinary specialties, or money transfer and payment on-line to access or ordering products and services. Citizens have access to the world market of products and services to the extent to which governments remove existing trade barriers because of the citizen-oriented technologies and applications available.

Citizen-oriented applications not only ensure the satisfaction of citizens in relation to their needs, but add an additional dynamic economy and trade. As we accumulate data and information which reflect the interests of citizens, through their processing to add value, with the possible character of generality, which may be relevant as a bag of knowledge. The forming of knowledge based economy involves therefore, the development strategy and involvement in everyday aspects of citizen-oriented computing applications.

## References

[1] I. Ivan and C. Boja, *Practica optimizării aplicațiilor informatice*, Editura ASE, Bucureşti, 2007.

[2] I. Ivan, D. Milodin and L. Săcuiu, „Calitatea datelor de intrare in aplicații distribuite," *Revista Română de Informatică şi Automatică*, Vol. 17, No. 4, 2007, pg. 35 – 48

[3] I. Ivan, G. Noşca and M. Popa, *Managementul calității aplicațiilor informatice*, Editura ASE, Bucureşti, 2006.

[4] I. Ivan, C. Boja, C. Ioniță, A. Pocovnicu and D. Milodin, *Practica dezvoltării aplicațiilor informatice orientate pe structuri de date*, Editura ASE , Bucureşti, 2005.

[5] I. Ivan, G. Noşca and S. Capisizu, *Auditul sistemelor informatice*, Editura ASE, Bucureşti, 2005.
[6] P. Pocatilu, *Costurile testării software*, Editura ASE, Bucureşti, 2004.
[7] I. Ivan, M. Popa, S. Capizisu, L. Breda and B. Florescu, *Clonarea informatică*, Editura ASE, Bucureşti, 2003.
[8] I. Ivan and M. Popa, *Entităţi text: dezvoltare, evaluare, analiză*, Editura ASE, Bucureşti 2005.
[9] *Ministerul Comunicaţiilor şi Tehnologiei Informaţiei*, Available at: http://www.mcti.ro
[10] L. Ciovică, "Open Source Caching Solutions," *Open Source Science Journal*, Vol. 2, No. 3, 2010.

**Ion IVAN** has graduated the Faculty of Economic Computation and Economic Cybernetics in 1970. He holds a PhD diploma in Economics from 1978 and he had gone through all didactic positions since 1970 when he joined the staff of the Bucharest Academy of Economic Studies, teaching assistant in 1970, senior lecturer in 1978, assistant professor in 1991 and full professor in 1993. Currently he is full Professor of Economic Informatics within the Department of Computer Science in Economics at Faculty of Cybernetics, Statistics and Economic Informatics from the Academy of Economic Studies. He is the author of more than 25 books and over 75 journal articles in the field of software quality management, software metrics and informatics audit. His work focuses on the analysis of quality of software applications. He has participated in the scientific committee of more than 20 Conferences on Informatics and he has coordinated the appearance of 3 proceedings volumes for International Conferences. From 1994 he is PhD coordinator in the field of Economic Informatics. His main interest fields are: software metrics, optimization of informatics applications, developments and assessment of the text entities, efficiency implementation analysis of the ethical codes in informatics field, software quality management and data quality management.

**Leonard SĂCUIU** has graduated the Faculty of Economic Cybernetics, Statistics and Informatics from the Bucharest Academy of Economic Studies in 2002. He is currently conducting doctoral research in Economic Informatics at the Doctoral School, Academy of Economic Studies. Fields of interest include distributed applications, SOA and web services, database management, network administration and open source technologies.

**Daniel MILODIN** graduated the Economic Informatics department of the Faculty of Economic Cybernetics, Statistics and Informatics in 2005. He followed the master program "Project's Computerized Management" between 2005 and 2007. He has published several articles in specialized magazines, articles focused mainly on studying and implementing the concept of orthogonality: the orthogonality of the alphabets, of the Arabic digits, of the Latin alphabet, of the distributed informatics applications and of the structured entities. The dissertation paper within the master is placed on the same line of research, "The projects' orthogonality, conditions of entry into the assessment program", proposing to define the projects' concept of orthogonality, methods for determining the degree of similarity between two projects, and also to develop software products for identifying similar projects. He is a PhD graduate of the Academy of Economic Studies,

specialization "Economic Science", with the thesis "The orthogonality of the structured entities".

**Mihai GEORGESCU** has graduated the Faculty of Electronics, Telecommunications and Information Technology – Politehnica University Bucharest in 2005 and also completed a master program at the Faculty of Economic Cybernetics, Statistics and Informatics from the Bucharest Academy of Economic Studies in 2007. He has experience in the development of software products using various programming languages like C/C++, C# both Windows Forms and Web.