TYPES OF CITIZEN ORIENTATED INFORMATICS APPLICATIONS

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The paper presents the concept of citizen oriented informatics application - AIOC. A classification criterion is proposed for AIOC. Informatics application structures are identified. For each type of application a practical implementation approach is presented. It defines a set of indicators which is an AIOC metric for which assessments are carried out.
A template design approach is proposed for AIOC.

Key words: informatics applications, citizen, quality metrics, applications types, template.

1. Citizen orientated informatics application

The knowledge based society is the new form of organization and functioning of the society. The explosive development of computing and communication technologies made the evolution to this new type of society possible. In the knowledge based society the base role is assigned to information of all types and to knowledge. This new society is characterized by [ROGH06]:

- a new product, the informatics product;
- the base entity is represented by the individual and the community;
- the characteristic merchandises are computing equipment, communications, informatics applications, informatics services;
- the majority of technologies are ecological and have reduced power consumption;
- working remotely;
- borders are eliminated, activities are unfolded over the Internet.

In the terms of the evolution of the knowledge based society, the quality demands for informatics applications grows. The new informatics applications are no longer instruments of organizations for which they were created, these applications must be orientated to satisfy the citizens. Considering the fact that geographical boundaries do not apply in the new society to informational streams, the new applications must address a broader segment of users with diverse characteristics and demands.
With the evolution of technology, the number of services which migrate from the traditional form to the online form grows as well. For these specific services an adequate providing form must be found in the online environment, using the proper technologies, guaranteeing the access of large number of users, fast and secure payment services.
All of these impose a reevaluation of quality demands of informatics applications in the online environment. Developing the application based on the old quality requests makes it noncompetitive in the new society.

Informatics applications corresponding to the new society are citizen oriented. They have the target group, citizen as a central element. AIOC are designed for citizens, to solve their problems quickly and the highest satisfaction degree. Compared to the traditional applications they are characterized by:

- the large number of simultaneous users;
- the mandatory update to correspond to environment changes;
- total adaptation to offer the highest degree of satisfaction to the citizens;
- null, or very small use cost;
- permanent access to online resources;
- coverage in the target group of all citizens that want to solve a class of problems;
- the need to solve problems for the citizens not for the organization;
- direct citizen interaction, without previous training.

In the new society the application evolution is vital because the pylons of the knowledge based society are the citizens, their community compared to the organizations which are placed in the background. The reorientation of applications to meet the citizens' needs is required.

Citizen oriented informatics applications – AIOC must correspond to the citizen needs, in this purpose they must have the following quality characteristics:

- *maneuverability* is the capacity to easily manage the application from the outside by the administrator and at the same tine to have the capacity to administer the user resources and to have access to complete information about previous transactions;
- *availability* is the capacity of the applications to run continuously, resources must exist in order to store results and information belonging to each user;
- *scalability* represents AIOCs' capacity to improve its performances upon new hardware installation;
- *functionality* refers to the quantity of processing made by the informatics application; any citizen orientated application must ensure total processing needed to solve the citizens' problems;
- *stability* is the capacity of the application to ensure variation proportionality regarding the input volume, processing volume and result complexity; small variations correspond to low volumes; large variations correspond to large volumes;
- *controllability* is the capacity to have its own adequate messages for each input message given to the user;
- *determinism* is the characteristic through which for the same input data the same result is outputted not depending on the user;
- *finite processing* which imposes that regardless of the processing type it should complete in a predetermined number of steps, and the number of selections is limited such that no cycles are created;
- *complexity* of the informatics application is given by the number of different structures used in the application and their appearance frequency;
- *reliability* represents the characteristic of the informatics application to run correctly and completely for all data sets inputted by the users;
- generality assumes solving the class of problems not solving the particular problem; generality is insured by avoiding variable hard coding within the application;
- *maintainability* is the characteristic of informatics applications which denotes fast updates at low costs;
- *reusability* defines the degree in which the application uses already developed components;
- *integrality* quantifies the extent to which the informatics application interacts with other informatics applications;

- *portability* establishes the measure in which the informatics application is independent from the hardware/software platform of the user.

Ensuring high levels of these quality characteristics of citizen orientated informatics applications leads to competitive applications which ensure high levels of user satisfaction.

The development cycle for citizen orientated applications differs significantly from the structure of the development cycle of classic applications, because of different pursued objectives and complexity differences.
The stages of AIOC development are:

- selecting and studying the target group;
- defining the problem to be solved;
- developing the specifications;
- interface design;
- creating the product structure;
- elaborating the components;
- testing on the data sets from the specifications;
- implementation;
- maintenance.

The development of informatics applications following these stages leads to obtaining competitive applications which satisfy the demands of the target group. The processing costs of these applications are very low or null. Updating the applications is made often to increase the user satisfaction degree, but costs are low because of the modular design pattern.

2. Classification criteria for AIOC

Citizen oriented applications are realized to solve their problems. Considering that the target group is large and diverse, the citizen oriented applications are very diverse in order to solve a multitude of problems. These applications are classified according to several criteria:

The interaction criterion assumes the classification of informatics applications according to the degree in which the users interacts with the applications. Following this principle the applications are divided in:

- applications in which the user does not input data;
- applications in which the user selects the input data from predefined lists;
- applications in which the user inputs data.

The content criterion realizes the classification of informatics applications regarding the content modifications. Based on this criterion the applications divide in:

- fixed content applications;
- applications whose content is modified by adding;
- application with content that changes over time;
- applications with content changed by addition, update and erasure assume recording of dynamic content.

The number of actions criterion classifies informatics applications according to the number of actions which can be made. Considering this principle the applications are divided in:

- one action informatics applications;
- multiple action informatics applications.

The complexity criterion oversees the number of solved sub-problems, the flexibility of offering alternate approaches, ways of generating selection criteria and the diversity resource allocation types and payment services.
In this context the following are identified:

- application with one specialized problem;
- average complexity applications;
- high complexity applications.

The completeness criterion oversees, helped by the application, the coverage degree of the specific citizen's demands. There are:

- partial coverage applications;
- full stream applications.

The instant result criterion classifies informatics applications considering the needed time to return the demanded result to the user. There are instant result and delayed result applications.

The security criterion divides informatics applications in safe and unsafe applications.

The cost criterions assume the classification of applications considering their use costs. According to this the following are identified:

- zero cost applications;
- individual session payment applications;
- subscription applications;
- paid applications.

The classification criterion insures an application division considering different criteria which directly regard citizens. As the classification is more clear the faster the citizen will choose an application from the set of existing ones.

3. Application structures

The structure of citizen orientated informatics applications differs according to the given functionality and the area in which it runs. Citizen orientated informatics applications work with:

- simple linked structure;
- linear structure and simple links between the components;
- linear structure and multiple links;
- tree structure and simple links;
- tree structure and double links;
- tree structure and multiple links.

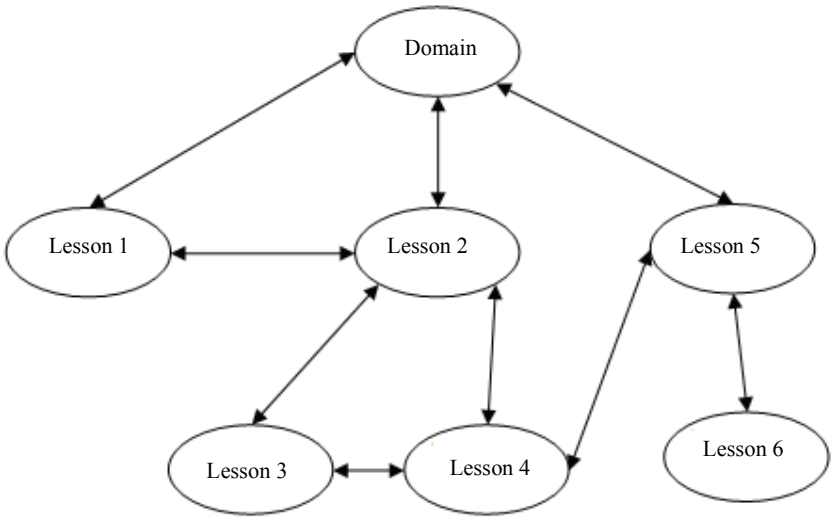

Figure 1. Tree structure with multiple links for interactive lessons

The structure for interactive lessons ensures connections between the lessons of the presented concepts. The lessons are learnt in ascending order of presented informations' complexity.

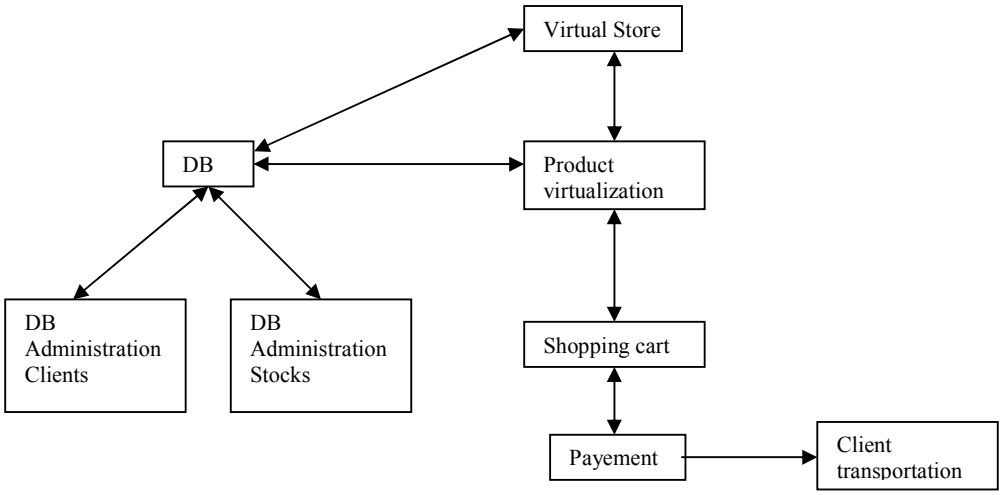

Figure 2. Structure for an e-business application

Using the adequate structure to realize the citizen orientated informatics application is determined by the type and complexity of the application that is to be developed. With no regard to the structure used, the citizen orientated application must follow the quality characteristics of AIOC.

4. AIOC in current use

E-banking services became a necessity for citizens in the context to of the knowledge based society. The lack of time required to go at the banks' headquarters in order to make transactions and the increasing number of them lead to the development of e-banking.
The e-banking services allow the banks' clients to make transactions regardless of their whereabouts if they have access to a computer linked to the Internet. E-banking has the following functionalities:

- consulting the current account;
- purchase of foreign currency;
- sale of foreign currency;
- making transactions;
- viewing the operations history;
- demo user account.

By using E-banking users have advantages like:

- they are not required to go to the bank;
- the transaction is completed quickly;
- the security of the transactions is guaranteed by the bank providing the service;
- the taxes and commissions are smaller then these billed when using the traditional approach;
- the service is available 24/7.

Within e-banking applications, security is regarded as vital. E-banking applications implement new technologies to ensure a high level of security.
Currently 72,98% of the banks active in Romania offer e-banking service.

Table 1. Banks that offer e-banking services

Nr.	Bank	Internet Banking	Home Banking	Mobile Banking
1	ABN AMRO Bank Romania	ABN AMRO NetBanking, Access Online-Romania	Office Net Romania	
2	Alpha Bank România	Alpha Click	AlphaLine	
3	Anglo-Romanian Bank Limited	i-ARBL		
4	Banca Comercială Carpatica	BCC e-SMART		
5	Banca Comercială Română	MultiCash BCR	MultiCash BCR	
6	Banca C.R.Firenze Romania	CR Firenze Online		
7	Banca Italo-Romena SpA Italia Treviso	Bank@You- Internet Banking		
8	Banc Post	Internet eBank	Internet eBank	
9	Banca Romaneasca	e-bancamea		
10	Banca Română pentru Dezvoltare	BRD-NET, BRD@ffice	MultiX	Mobilis
11	Banca Transilvania S.A	BT24	BT-Ultra	
12	BANK LEUMI Romania (fosta EUROMBANK)	Leumi Online		
13	Citibank Romania	CitiDirect Online Banking		
14	Egnatia Bank România		MultiCash	
15	EMPORIKI BANK (România) S.A.	UBISQL Internet Banking		
16	EXIMBANK S.A.	Internet eBank	Internet eBank	
17	FINANSBANK(Romania)	FINANSnet		
18	GarantiBank International NV Suc.Romania	Garanti Online		
19	HVB-Tiriac Bank	OnLine B@nking	Multicash	
20	ING Bank N.V. Amsterdam	ING Online, HomeBank	Multicash	
21	Libra Bank S.A.	LIBRA WEB BANKING		
22	OTP Bank Romania	OTPdirekt	HBS	
23	Raiffeisen Bank	Raiffeisen Online	MultiCash	myBanking
24	ROMEXTERRA BANK S.A.	TerraBanking		TerraM- mobile banking
25	S.C. SANPAOLO IMI BANK ROMANIA S.A.	SANPAOLO B@NK		
26	UniCredit România	UniCredit Internet Banking		
27	Volksbank România	MultiCash@SmartOffice	MultiCash Clasic	

Source: MCTI and the commercial banks (updated february 2007)