The development of computer science oriented towards the citizen

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Abstract: The concept of informational application oriented to the citizen is defined. The quality characteristics for the informational applications developed under the conditions of computer science oriented towards the citizen are settled and the structure of the development cycle for these applications is presented. The conditions of existence for applications oriented towards the citizen are defined. Strategies on medium and long term are structured.
Key words: distributed applications, metric units, orientation towards the citizen, strategies.

1. Computer science applications orientated towards the citizen

The computer science applications orientated towards the citizen present characteristics which recommend the application to be used by simple users:
- contain computer science applications without operator; the entering data is introduced only by the citizens in the society and the executors from organizations;
- the persons in the management have the decision role, concretized through variant selection and signing of decided variant;
- the information in the databases are the ones that generate activities within the organizations, performing personalized products and services, offered to the ones that requested them.

The computer science orientated towards the citizen presumes data collection in order to create patters and the adaptation of robotized equipment. Among the advantages on the citizen's level we remind: the product is exactly for him, good acquisition price, delivery on term, quality and personalization of the product. On the level of organization appear advantages regarding customized products requested by the customers, products that have buyers among the citizen. The markets are influenced by shop reorganization and their decreasing role. At the moment, the steps needed for creating software for sale are:
- problem definition identifies the characteristics of the studied problem;
- specification elaboration, existing environment investigation are analyzing the problem;
- solution elaboration sets the ways to solve the problem;
- code writing correlates the theoretical solutions with the practical ones, implemented using a programming language;
- testing assume checking the application functionality;
- documentation elaboration assure information needed for using the application;
- implementing includes all operation performed in order to install the product;
- maintenance is the process which characterize the software products which are used more than 3 years; due to the evolution of technology, legislation, collectivity the software products must be update it.

The existing applications subordinate user to obtaining the inputs for organization. In these applications:
- the operators introduce data;
- the quality is orientated towards the beneficiary organization;
- the citizens receive the outputs from the application;

- the citizens authenticate and introduce data, but the problem solving depends on the organization owner of the application.

This optic must be radically changed in order to help users to solve their problems on-line. For that, there are some steps to be follow:

The target group is defined as number of persons, structure, characteristics, qualification, age, aptitudes to work on a computer. The dimension of the sample is settled starting from estimations. The problems that the persons in the target group wish to solve on-line are identified. The beginning is made from defining the problems of the citizens and not from the organization. Specifications are elaborated beginning from the citizen's exigencies, and the organization owner of the computer science application is actually supplying services to the citizen. Its advantages result as a percentage part of the citizens' advantages. The developing cycle of the computer science applications oriented to the citizen contains:

- target group definition;
- problem definition for the target group;
- the elaboration of the specification to satisfy the exigencies of the target group;
- the elaboration of a solution to produce economy and satisfaction to the persons in the target group;
- code elaboration that allows the processing and acquisition of different sets of data of the persons without operators;
- the testing for the application to be correct, fast;
- the implementation for the citizen;
- the assistance for citizens and corrective maintenance in real time;
- friendly interfaces making;
- insuring the structure continuity, consecrated interfaces and vocabulary.

Respecting the criteria from above contributes at creating applications oriented towards the citizen.

2. Quality characteristics of applications orientated towards the citizen

Unlike the classic computer science applications in which the owning organization but also the developer accept the quality of a computer science application distributed as being the totality of technical, economical and social features, for the computer science applications orientated towards the citizen, the quality has a new content as these applications are or not good depending on the degree of satisfaction offered to the citizens.

The citizens are not simple users of the computer science application in the meaning that they dictate data to the operators or identification elements and a few variable fields in order to start acquisitions, payments or to perform services (testing, documentation, architecture projects). In the new created context, the citizens introduce data, start selected actions, and start processes.

This is why the computer science applications orientated to the citizen must respect conditions like:

- be easy to understand, the type open and work directly;
- have minimum flows, very few selections until it reaches what it has to solve ;
- maximize the reuse degree for the data.

The technical characteristics of software product are: functionality, reliability, use, efficiency, maintenance and portability.

A software product is **functional** if the transformations it makes lead to the acquisition of results that quantitatively and qualitatively correspond to the product's specifications. The evaluation of the functionality is performed by successive tests of the software product by involving a group of target citizens and by verifying the associated source text and used components.

The **use** appreciates the necessary effort for the use and individual estimation of each use by a target users group. In insuring the usability, an essential role has the citizen's point of view representing the final user and less the developer's point of view.

The **efficiency** refers to the relation between the performance level of the product and the quantity of resources used under settled conditions. A software product is efficient when there is an optimum report between the consumed resources and the complexity of the problem that is solved. The financial effort

which the citizen has to bear by using the software product must be correlated with the satisfaction it offers. All the same, the hardware and software resources necessary for using the product must be available for the citizen: medium computers as performance criteria, popular software, no restrictions related to the internet connection speed.

The **reliability** refers to the capacity of the software product to maintain its level of performance under settled conditions for a determined period of time or the probability of apparition of an interruption of the product's execution under the specific using conditions. It is accentuated by the software product's behavior, more precisely, the error tolerance. The estimation of reliability is performed through direct measurement or based on information related to the development of the product. Non-reliability regards the effects the interruption of execution has over the citizen and the volume of compensations which the organization has to offer.

In the old approach the processing of the non-reliability was seen through effects on the level of the application's owner. Now the owner is serving the citizen. He has profit from the citizen but pays the citizen if he is not content.

The **maintenance** is based on a set of indicators that measure the effort necessary for the specific modifications. A product can be maintained if it offers the possibility of an easy and fast update, having as object the performance of processing functions under superior conditions, as well as the implementation of new processing functions. The computer science orientated towards the citizen imposes a high maintenance in order to respond to the divers requests of modification and adding of services. If the organization does not answer affirmatively in a reasonable period of time, normally in a competition economic environment, the citizen will go straight for competition to solve the problems.

The **portability** is a characteristic that appreciates the software product's capacity to function without modifications on diverse hardware and software platforms. The organization cannot impose the citizen to use a certain hardware/software platform. Still, if it makes it, it must undertake certain negative consequences that arise from the orientation of a part of the target group to other software products that are less restrictive in this meaning.

The social characteristics manifest through effects determined by the product in large collectivities of users through the role it has in solving their requests. These characteristics are reflected in the effort the users depose to get used to the specific working mode of this, but also how much the program responds to expectancies.

The quality of a software product is influenced by the quality of the entering data. The extend to which it responds or not to the citizens' requests cannot be evaluated regardless of the completeness, correctitude of the entering data, redundancy and their comparability.

3. Types of computer science applications orientated towards the citizen

Computer science applications with integrated data bases presume the solving of a problem in which the citizen always supplies his personal number and the owner of the application will access all the databases necessary for solving the problem playing their owners without obliging the citizen to financial efforts.

The old variant: in order to create a bank account, the citizen presents to the bank with a lot of documents and money.

The new variant: the citizen provides his personal number to the bank and says what type of account he wants. The bank accesses the database of the population, the database of the diplomas, the databases of the revenue office, and the databases of the citizen's work place and builds a registry with points and gives him or not an account.

The driver's license application, flow of operations:

I. the citizen introduces his personal number;
II. the software product accesses the databases of population evidence and fills in the registration certificate with the data taken from this database, including the citizen's photo;
III. the citizen verifies the data in the form and if it is correct approves the passing to the next step;
IV. the citizen is proposed a programming to the psychological evaluation;

V. after the positive evaluation, the citizen reenters into the application and reintroduces his personal number to start a programming to the written test;
VI. if he passed the written test, also based on his personal number he will obtain a programming for practical evaluation;
VII. if he passed the previous step, at a new entering into the system he will pay on-line the taxes afferent to the issuance of the driver's license;
VIII. if the payment has been accepted he will receive his driver's license by postal service with receipt confirmation.

The same data is used for distance diagnosis. There are equipments for pulse measurement, blood pressure, public computerized tomography and the data are transmitted to the specialists.

4. Medium and long term strategies

The industrial revolution of past centuries was based on the power of the steam, the physical force of man and money capital. The wealth and power of our century will come with priority from the intangible intellectual resources, from the knowledge capital. The revolution of knowledge and the passing to the economy based on knowledge is a process that generates changes in all the components of the economic activities.

The profound changes that produce in the economy, companies and management based on knowledge must be reflected in new approaches of the organization's strategy. Thus the knowledge and the organization's capacity to learn become very important.

Therefore, the organization goes on the market with knowledge products and services, in the general context of continue innovation. The strategy on medium term provides:

- the classification of the types of citizens problems;
- priority definition;
- the creation of infrastructure in order to allow the citizens the access the resources of the distributed computer science applications;
- the creation of advantages for the citizen to solve the problems by accessing the distributed computer science applications.

The strategy on long term regards:

- the increase in the diversity of means of purchasing the personal data from citizens;
- the generalization of resources allocation by accessing the distributed applications, like the ones used for tickets reservations;
- the work in regime of subscription, like accountancy application; now every organization has its own software, but in the future there will be a server which will grant the access to the accountancy software, based on a monthly subscription.

There will be eliminated the use in excess of traditional ways of working, paper filling in. All activities will be executed using an accessing card to the services and a password attached to the card.

5. Conclusions

Computer science oriented towards citizen offers solutions for a society based on knowledge. Services and products are bought using applications which control both buyers' identification data and services provider data. Knowledge societies are based on large databases interconnected which assure citizen identification and their access to services.

Passing from the classical computer science to the one oriented towards the citizen is a necessity. It requires new technologies, new metric units, another endowment degree, very good software products and databases interconnected used to control all data which assure the orientation of the application towards citizen.

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