DOI: 10.34185/1991-7848.itmm.2023.01. 063

MODERN UKRAINIAN FEATURES OF THE SYSTEM DESIGN OF IT-ARCHITECTURES OF REHABILITATED ENTERPRISES

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Annotation. After the end of martial law in peaceful Ukraine, one of the priority tasks will be the reconstruction of destroyed enterprises and industries. These processes must begin with the conceptual design of the IT architectures of the restored enterprises. However, the successful resolution of these tasks has a number of established difficulties. The paper provides a list of these features, which affect the paradigm shift of computerization and the transition of management systems to socio-computer-integrated systems. These peculiarities require changes in the training of Masters in Computer Engineering and their accelerated training in the new curriculum (as future systems analysts). In order to organize such training, a methodology for conceptual design of it-architectures, including Soft Skills, is proposed.

Keywords. Ukrainian features, system design, it-architecture, rehabilitated enterprises, Soft Skills, GEntA, systems analyst.

Introduction. It has been said that all natural events and wars, once they are over, open up opportunities for new and original solutions in all spheres of life. And the effective rebuilding of a country always begins with education. In my opinion, this is also true for the processes of creating new automated enterprises and productions based on their future it-architectures. The paper describes the author's subjective view of these problems in Ukraine and ways of overcoming it.

Analysis of difficulties and how to overcome them. The current stage in the design and implementation of enterprise automation systems is characterized by the following features.

1). There is a change in the paradigms of enterprise automation associated with the increasing complexity of the created systems, which are becoming socio-computer-integrated systems [1].

2). Scale of the designed systems transfers computer systems into the class of enterprise data processing centers (DPC).

3). For such a class of systems the functions of computer engineering specialists change. They are not engaged in solving local problems and setting up hardware and software, but move to the level of system analytics, the main task of which is to design and develop the it-architecture of the enterprise.

4). In Ukraine, the military situation makes such tasks more difficult.

4.1). A large number of totally destroyed enterprises require rebuilding them from scratch.

4.2). The second feature is the dequalification in systems engineering,

associated with the involvement of IT engineers in military operations or with their travel to Europe and Asia.

4.3). There is an urgent need to change the curricula of computer engineering training to form a new generation of domestic systems analysts.

4.4). However, the process of training of national cadres of systems analysts is complicated by the used online distance learning technology and the reduction of budgetary places in the master's degree programmes of Ukrainian universities.

The author doubts the interest of foreign spcialists in effectively solving the problems of rebuilding destroyed industrial enterprises, which will take a long time.

These circumstances determine the relevance of the formulated topic of the report. The paper describes basic components of enterprise it-architecture and a special generator of variants of templates of architectures to determine in the laboratory conditions of rational software and hardware solutions to implement common algorithms of functioning of socio-computer-integrated enterprise management systems.

Generator Enterprise Architecture - "GEntA". The architecture of a modern automated enterprise is a complex system (Fig.1) of interconnected 7 types of wares: technical, mathematical, software, information, linguistic, organizational and operational documentation [1]. In fact, the architecture is a multistructure, interconnected structures of wares types or sub-architectures. One variant of the ordering of architectures is shown in Fig. 2. A template generator of industrial enterprises GEntA is proposed for planning the architecture of the enterprise to be automated. The template variant describes both the enterprise structure and the requirements for the implementation of applications and its business logic.

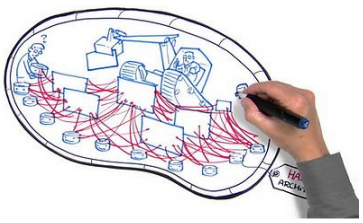

Figure 1 - Work of the system analyst [2]

The generator enables the topology of the production facility layout to be formed on the company premises. These include several technological processes of a given structure and control centers with a set of serviced equipment. Each technological process is described as a sequence of technological sections with a set of sensors and actuators. Each technological process section is described by types of signals processed by the system and intensities of their appearance at the system inputs. The template describes a set of tasks to be solved as FPB (functional program blocks).

The complexity of each FPB is estimated by the number of operations of the different types of its implementation. The generator generates a system database of

arrays of different sizes. This specifies which part of which arrays is used by each FPB in its single execution. The operation of the designed system is described by means of fi-transactions.

The scheme of information flows of messages and control actions between technological processes and dispatching centers is specified for each fi-transaction.

For each fi-transaction, a maximum allowable processing time, or deadline, is set.

The generator allows varying the number of technological processes. Generated variants are given to students or engineers for conceptual design of rational it-architecture of a particular enterprise. The complex of models and programs for obtaining variants of structural-technical solutions [3] is offered to perform corresponding design-research works.

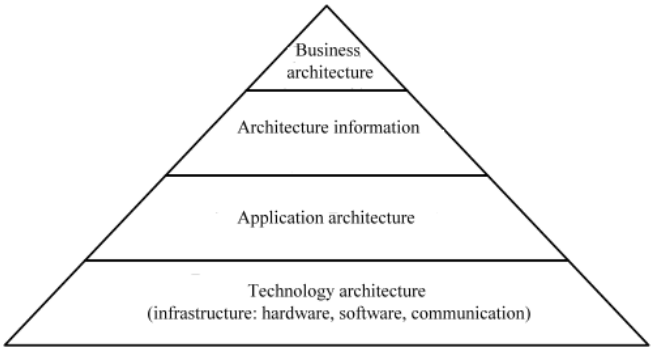

Figure 2 - The multi-level description of the enterprise architecture [4]

Conclusions. The proposed analysis of the situation related to the reconstruction of destroyed enterprises shows the great role played by education in terms of training masters focused on the conceptual design of it-architectures of modern enterprises. In order to train master's students to solve problems on the choice of rational structural and program technical characteristics of the information infrastructure, it is proposed to use a special generator of templates to describe various automated production processes and enterprises **GEntA.**

Reference

1. Kosolapov A.A. SMENA PARADIGM KOMP'IUTERIZACII // Avtomatizaciia ta komp'iuterno-integrovani tehnologii u virobnictvi ta osviti: stan, dosiagnennia, perspektivi rozvitku: materiali Vseukrains'koi naukovo-praktichnoi
Internet-konferencii. - CHerkasi, 2020. - s. 22-23.

2. Podchasova S. Arhitektura predpriiatiia glazami analitika [Elektron. Resurs]. - Rezhim dostupa: https://www.artofba.com/post/...26 sent. 2019 g.

3. Konceptual'noe Proektirovanie Komp'iuternyh Sistem Real'nogo Vremeni. Codecs - Zadachi, Modeli, Metody, Algoritmy, Programmy. Monografiia / Anatolij Kosolapov - Izd. Dom Lap Lambert Academic Publishing, Beau Bassin, Mauritius, 2019. -189 s.

4. Serikov A. Elementy Arhitektury predpriiatiia. Biznes-arhitektura i arhitektura informacii [Elektron. Resurs]. - Rezhim dostupa:
https://intuit.ru/studies/mini_mba/3413/courses/152/lecture/4230.