

модуль мовою *Visual Basic for Application* (приклад процедури для 6-ти рівнянь):

```
Public Sub SLrivr()  
With Application  
Range("H2:H7") = .MMult(.MInverse(Range("A2:F7")),  
Range("G2:G7")) End With  
End Sub
```

Звернення до такої процедури можна здійснити за допомогою макросу. Набуті таким чином навички студенти з успіхом зможуть застосовувати і в інших навчальних дисциплінах.

УДК 004.415.5

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ПРО ПИТАННЯ ВИБОРУ АРХІТЕКТУРИ ОНЛАЙН-ПЛАТФОРМИ ДЛЯ ВИКЛАДАННЯ ІТ-ДИСЦИПЛІН АНГЛІЙСЬКОЮ МОВОЮ

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ON THE ISSUE OF CHOICE OF WEB-PLATFORM ARCHITECTURE FOR TEACHING IT-SUBJECTS IN ENGLISH

IT-branch is developing very fast nowadays. Lecturers and tutors need to follow all IT-innovations to teach IT-related subjects at the decent level. To achieve this goal it is very helpful to use sites of well-known corporations. Among them are Microsoft, DLink, CISCO, ORACLE, and US universities sites (eg, MIT [1]). The authors of this paper have the experience to use Microsoft websites [2] and international organization W3C [3] to create lecture materials and guidelines for tutorials of following subjects: "Object-oriented programming", "Organization of databases and knowledge", "Web programming", "Operations research". Of course students can use most of those sites independently but it is difficult for them to find needed materials and summarize them. Only experienced lecturers can extract the most important concepts from thousands bytes of information and lay stress on the main notations and definitions. It is very convenient to arrange all the materials on web-site which is available for students anytime and anywhere. The component technology given below can be used for such online system design.

The component technology is applied widely for design of software systems (SWS). It is grounded on the usage of components taken from earlier executed projects (reused components). The architecture according to this technology is designed by the frame selection based on the requirements to the SWS and filling it by necessary components taken from the repository or from Internet. The frame is a high-level abstraction of the SWS design; it combines set of interacting objects into some integrated environment [4].

The pattern is an expansion of the component concept. It is an abstraction, which contains the description of interactive objects in generalized cooperative activity where roles of participants and their responsibilities are defined. The great amount of components is developed. They are classified according to the types and kinds of applications, and also the technologies of their usage for SWS architecture design. Since the repository of patterns as usual contains several components, which implement the same functionality, so for component technology of design we will obtain the set of alternative SWS architectures. Selection of the most acceptable option of the architecture with respect to the set of quality criteria requires either to range alternatives according to the values of quality criteria or to use some integral index with own value for each alternative

Some methods for SWS architecture evaluation are used on practice. The most popular methods are based on the development of use case scenarios and testing whether certain architecture satisfies to quality criterion. ATAM and SAAM are the most known methods of this type [5]. The common disadvantage of these methods is that their implementation requires to create and analyze rather large quantity of use case scenarios, what makes them laborious, expansive and complicated for formalization. That is the appearance of papers where the Analytical Hierarchic Process (AHP) was proposed for the solution of this problem allowed to improve the procedure of architecture selection considerably and to formalize it for automation of decision making processes [6].

Final selection of architecture option taking into account all the criteria is performed often via replacement of multi-criteria optimization by single criterion one represented by scalar criterion usually expressed as additive convolution of partial quality criteria. Usage of scalar convolution requires to assign weights to partial quality criteria by expert method. This procedure as rule is badly formalized, has subjective nature and is additional source of errors. The trade-offs made between criteria remain hidden when scalar convolution is used. The procedure of trade-offs assignment for partial criteria weighting has to be formalized in order to reduce the subjective influence on the weights of quality criteria selection and to take into account requirements of subject area. The idea of universal scalar convolution can be applied where the target function that depends on the level of situation tension is optimized. The tension level is defined by the proximity between values of criteria to their threshold values. The iterative procedure may be applied for formalization of the process of quality criteria weighting.

An important problem related with the usage of educational materials of software and hardware manufacturers is compliance to the laws of copyright. The authors of this paper use only the materials provided for educational purposes, which are free available [7]. Moreover, the references to the original source are always present in materials intended for students.

References

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