

A TOOL FOR WEB-PAGE EVALUATION: SOME MODELLING REQUIREMENTS

A photograph of a construction site at sunset. The sky is a mix of orange, pink, and blue. In the foreground, there are several cars parked in a lot. In the middle ground, there are several cranes and cranes. One large crane is on the left, and two smaller ones are on the right. There are also some tall poles with lights. The overall scene is dark, with the sunset providing the main light source.

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Brief content:

- 1. Introduction –setting of the problem**
- 2. Model's elements specification**
- 3. Relation between elements – concept of structure of the model**
- 4. Some conclusions**

Purposes:

The basic aim: analysis of possibilities of applying expert systems' mechanisms in the evaluation of websites from point of view of modelling requirements

- **In order to realize this objective - creation a model concept of a system that would automatically choose the website which would be the best from the point of view of a specific user.**
- **This way the system would help to find a solution of problem: which of the functioning websites demonstrates the greatest usefulness with regard to the applied set of criteria?**
- **The existing procedures and the methods which are available at present cannot provide us with a univocal and universal answer to the issue presented in the beginning of this article.**
- **The proposed model of the system may help to find the desired solution.**

Modelling requirements – factors of the system specification

- **user category – detailed objectives of each kind of users – the status which, to a large extent, determines our further selection procedure. A website designer, owner – website administrator and client tend to have entirely different aims,**
- **sector, service branch – a set of evaluation and selection criteria may be completely different depending on the status of each of the specified users,**
- **scope and accuracy of the study – an opinion of a single expert or a selected group of experts from each sector/branch, opinions of selected group of users or interviews with a randomly selected group of users/potential users,**
- **a set of basic criteria groups and specific criteria within each group. The number of criteria and their attributes may vary in subsequent studies depending on the objectives specified by a user from a particular sector, and also, as it turned out, they may depend on the economic situation of a country where the research is being conducted,**

Modelling requirements – factors of the system specification

- **a specific method of addressing the problem. It may be a single, simple methodology or a combination of methodologies. These methodologies may be e.g. of a linear, relational, scoring, value or mixed character.**
- **method's environmental conditionings – taking into consideration a preference scale (expert's opinion or automated calculations) and evaluation (ratios) of the risk connected with realizing the method,**
- **the quality of data – especially important during a screening process; information should be substantiated and preliminarily prepared for analyses, before it is further processed,**
- **IT infrastructure – supporting the processing of data which are needed for our decision-making process – software and calculation procedures of particular methodologies,**
- **the way of interpreting findings – in a tabular or graphic form.**

User category

- The examined problem is being solved for the user, which decides what actually should be considered in the research.
- An IT system designer has a different approach to the issue of website's usefulness or functionality than an average end user who the system is targeted at.
- An end user pays greater attention to those evaluation criteria which are related to the ease of navigation, website's functionality which is close to the real one (usefulness) and, finally, economic aspects which are connected with the content within the technical framework (price relations of goods/services as compared to the real market).
- In the case of a system's designer, these are mainly technical aspects (proper functioning), visualization (esthetics) and those connected with the website's security (protection measures).
- Both points of view are important for the owner of a website; however, we may observe a tendency to attaching slightly greater weight to the client's point of view – as, ultimately, it is the end user and not the creator of the tool **(role of open models?)**

Sector, service, branch

- **The research showed that one universal, standard set of criteria which would be suitable for all occasions does not exist.**
- **The differences between sectors (e.g. banking and trade in manufactured goods) are much greater than between branches (computers and cosmetics, cosmetics and clothes/footwear, etc.).**
- **From the point of view of a system's designer, it would be recommended to undertake a constructive confrontation of the scores obtained in the study of the established solutions with a properly performed analysis of the user's information needs.**
- **The evaluation of websites is treated then as an element of typical research carried out prior to the project, where, additionally, the author needs to take into consideration the specific requirements of the mandator of the task.**
- **We should also pay attention to the economic situation in which the study is being performed. Electronic economy is based, to a large extent, on clients' trust. At a time of crisis we may observe considerable diversity.**

Scope and accuracy of the study

- There are cases where a mandator is interested only in a general and quickly formed (preliminary) opinion concerning the quality of websites in a given branch. In such a case the entrepreneur consults one expert, formulating his or her own evaluation criteria to be used by the evaluator and preferences concerning their structure. After becoming acquainted with such an opinion - the mandator delegates the task of making further detailed assumptions to a corporate website designer whose task is to construct and launch a website. It is very simple, but subjective.
- One of the methods used to limit the subjectivity is consulting a whole team of experts who represent a homogeneous group (the same qualifications) or a group which is diversified with regard to their status or skills. We may arrive at a better approximation of the objectified scores by means of averaging (or taking into consideration a median of their responses).
- In the case of more complicated methods there occur problems with training an expert to provide responses (evaluations) to the addressed questions (problems have already appeared when AHP method has been applied).
- Other problems may emerge during conducting research on a large scale. Firstly, in the case when respondents are chosen at random, the number of responses markedly decreases
- Secondly, the survey should be as simple as possible

Set of criteria

- The description of criteria should be analyzed with regard to its meaning – the language of an analyst, designer and programmer may be entirely different from the language of an end user (or generally, the language of business).
- Therefore, the languages should be made as similar as possible, through coordination, simplification and unification.
- Such practices are not commonly used; instead, established sets of factors with specific terminology are prepared e.g.: organizational, functional, technological, legal, economic, cultural, or the one referring to the level of security.
- In each of the groups particular subcriteria undergo marked differentiation depending on the sector/branch they relate to or the objective of the study (**role of open models?**).

A specific method of addressing the problem

- **A commonly applied ranking method, which is easy to use and simple due to its interpretation of scores, has been applied and tested several times - the specific simplicity, linearity of the evaluation, its susceptibility to structural diversity (the more subcriteria of a given group, the greater its weight in the final score) and the aforementioned subjectivity.**
- **The author initially concentrated on the modifications of the ranking method. - proceeded to use a survey on a larger scale and calculate average scores, and went on to undertake preliminary processing of the data., then applied: group standardization – each group was assigned a maximum value equal to one and a simulation of preference scale variants.**
- **Simultaneously, the author has started tests concerning a possible application of a relational method. The author has chosen T.Saaty's AHP/ANP method as the most popular and the simplest one with regard to its ideology.**

A specific method of addressing the problem

- **The experts objected to the necessity of filling in a great number of tables: first, relations among particular criteria, then particular websites with regard to the established criterion.**
- **Next, together with the increase of the number of criteria and subcriteria, experts faced great difficulty evaluating relations among them: a simple maneuver of changing the order of criteria in the table resulted in marked differences in the obtained scores .**
- **Moreover, in order to make calculations, it was necessary to apply a special software package or engage in laborious calculations performed in spreadsheets.**
- **The method itself cannot be quickly acquired by an average user, and its results have not been treated seriously.**
- **Then the author has constructed a special conversion method transforming the results of partial experts' evaluations into relations among criteria, and subsequently, relations of websites in the realization of particular criteria**

Relation between elements – concept of the model

- As it has become apparent in the above specification, creating an IT system that would support a decision-making process in the examined case is not an easy task due to the quantity of data, increasing exponentially, which (together with their mutual relations) should be processed by the system.
- Simultaneously, the specification which has been constructed in the second part allows for analyzing the problem and presenting it in the form of an orderly, model research procedure.
- Also, we should remember that in a given case we use a limited, specified amount of gathered information; also, a number of methods which may be potentially used to process the data increases.
- Basic elements of the model are: **Analyzer, Simulator, Solver, Interpreter, Verifier.**

Concept of the model -Analyzer

- The basic task of an **Analyzer** mainly consists in allowing the end user to **communicate with the system**.
- It is a complex task because it should be made up of a few subsequent steps.
- In the first step, a user should have a chance to **ask a question**, which on the one hand, would express his intentions, and on the other, it could serve as a basis for initiating further actions.
- In order to address the first problem we should deal with the issue of **correctness of the categories** and the correspondence of the categories known to the user and those which function in the system.
- It happens that the treatment of the same variables from the point of view of a user and a system designer may be entirely different.
- Next, we should **construct a mechanism which helps to specify the scope of the research** either by means of subsequent questions or by selecting available options from the menu.
- In the third stage, we should **ensure internal consistency and integrity of the question which is being asked**, from the point of view of limitations which result from the previous selection.
- The Analyzer will aid with making a **choice of a category of a user, branch where he or she wants to operate, and the scope of the actions which are to be undertaken**.

Concept of the model - Analyzer

Analyzer should be supplied with database information concerning:

- **a status of a user** (a functional user, analyst, designer, website administrator, etc.). A status of a user will be related to defining or selecting criteria groups (from a list) specifying characteristic features which are important from the point of view of particular categories of users,
- **division into sectors and branches** within the sectors (e.g. financial services (banking, stock exchange, insurance, customs); trade (computers, clothes, cosmetics, sportswear, etc.); service (tourism, recruitment, property trading etc.)). Each sector/branch will have a maximum set of criteria for detailed evaluation attached to it. This set will be available to specific categories of users to view (only) or to select (from a list); or a user will be able to add his or her own categories,
- **a list of experts from particular sectors** (to select) and a possibility to generate (enter, import from a given format) one's own list of users evaluating websites,
- **sets of criteria groups** and specific criteria in a hierarchic, narrowing subdivision with regard to the user's status, sector, branch and range.

Concept of the model - Simulator

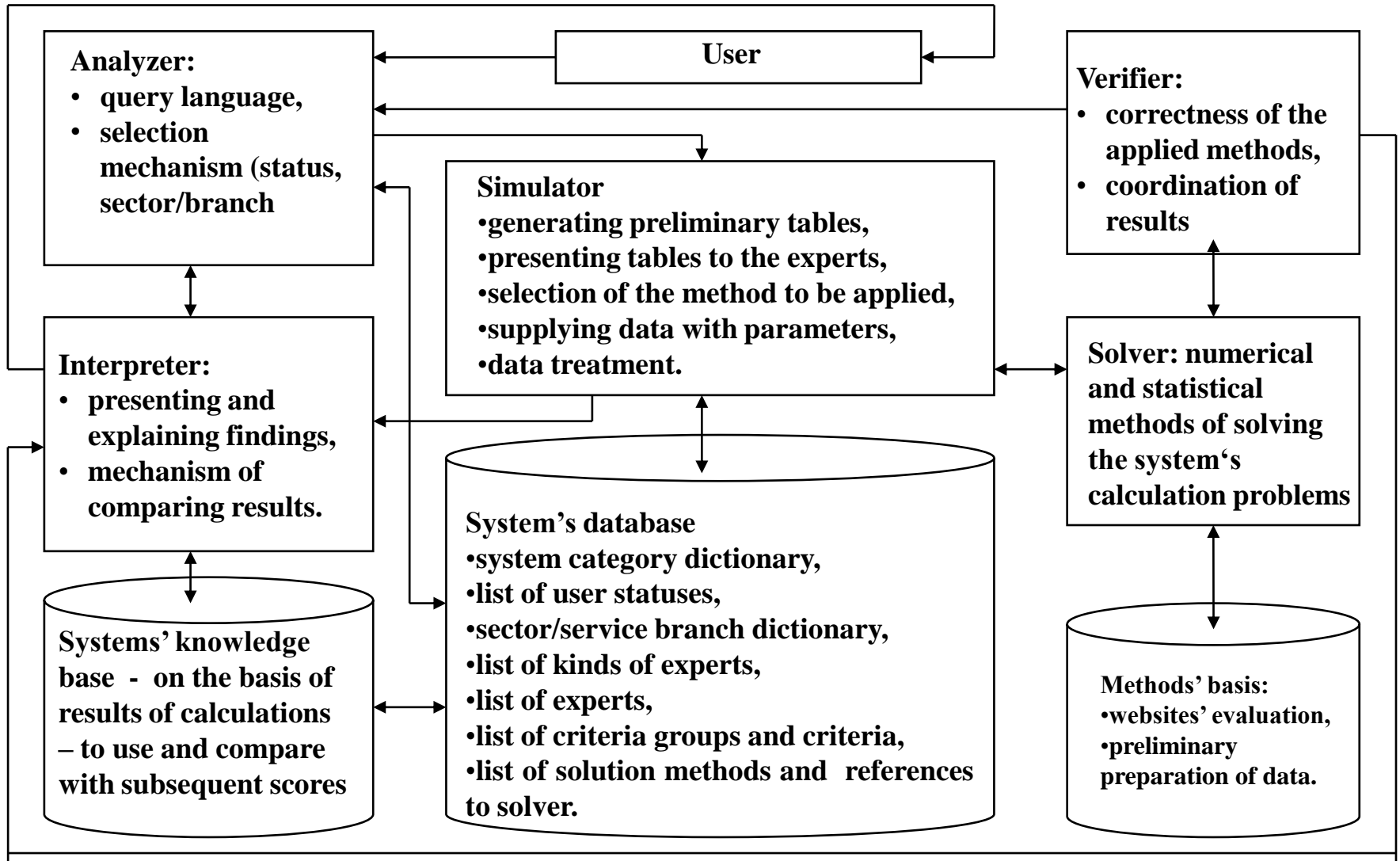
A Simulator module will be used to gather basic data for performing calculations. Its role consists in generating tables which would enable an expert (experts, website users) to evaluate the phenomenon (evaluation of specific criteria), and subsequently, the expert would be able to sum up the evaluations and calculate additional indicators which are required for further analyses. Additionally, it should have the following mechanisms:

- selection of a specific method used to solve a research problem, together with an attached software package which enables its application (it is important in the case of complex methods, especially relational, value conversions – basis of solution methods),**
- mechanisms of supplying some methods with additional parameters such as preference coefficients, risk coefficients, coefficients of usefulness, etc. which would automatically suggest options or give a chance to add one's own solution,**
- mechanism of processing data in the case of selecting general solutions with access to the required statistical packages, or developed, selected (or to be chosen by the user), necessary statistical methods.**

Concept of the model – Solver, Interpreter, Verifier

- **A Solver module should be used as an additional, supplementary calculation back-end of the designed system.** According to previous comments, it should contain a package of evaluation methods for websites (possibly to be complemented) as well as methods used for preliminary preparation of data to be processed.
- **Basically, an Interpreter module may be destined to realize two objectives.** Firstly, it may be **helpful in interpretation of scores and their presentation in a desirable graphic form** (the issue of selection of data to be presented and their form: table and a type of a table, graph and a type of a graph, etc.). Its second objective is **comparison of results obtained by means of various methods of websites' evaluation** (collecting scores obtained from various methods, adjustment to comparability and help in presenting scores).
- **A Verifier should become an additional module.** Its primary tasks are: **verifying the correctness of methods used to solve specified problems of a user and coordination of the system's operations.**

Logical framework structure of expert system supporting evaluation of websites



Some conclusions

- **The presented concept is still being developed. It is a continuation of work concerning evaluation methods of websites' quality and usefulness.**
- **On the basis of the concept, after its specification, we can create a logical project of the system that can be systematically developed in order to expand the base of sector/branch criteria and to apply procedures and methods for the evaluation of the examined phenomenon which have not been tested so far.**
- **Probably the best for the concept would be supporting the tool on the idea of open models creating by end user or designer of the system.**
- **Importance idea of open modelling for end user – possibility of creation at least set of evaluation criteria or making some decisions for methods and procedures of solving problem ,**
- **Importance for designer – possibility of experiments with different forms of models for many kind of users, possibility of approximations used as models for user requirements etc.**

Thank you for your attention!

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