FEED-IN MISTAKES IN COMMUNICATION BETWEEN THE MODEL AND THE USER

CHYBY V KOMUNIKACI MEZI MODELEM A UŽIVATELEM

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Annotation

Today's level of the model vs. user communication is not very high. Nonprofessional users do not know how to use the model; in spite of this it can help him a lot, because the nonprofessional user is a professional in his job. We can do everything with technologies, but there are limits to our knowledge. That is why we have to find the limits of the need and utility. The goal is not a perfect illusion of a model, but it is a perfect communication too, between a man and a model use. The research barrier is to find the right rate between the perfect character display and the perfect communication.

There are demands for building a model. The user has to be able to communicate with the model or generally with every instrument. The complexity of systems is growing also. So the user has to know these systems, especially know how to use them and know how to read results of computation at the end. So it is necessary to further communication between the user and the model so it can be user friendly as possible. Also so a non-professional user would understand it.

Communication between the model and the user should find an environment that is based on standard, often used, communication instruments. It should include communication instruments that are typical for model making too. Mathematical models should be an invisible part of the decision making, mathematical models in a user preferred form, and this is because of the quality of cognition for user, not for his/her comfort.

An array of mistakes is possible when making and modifying a model. Any mistake could jeopardize the whole model. There is a requirement to have easy and correct made elimination of mistakes in the feed-in model. So that every part of every new environment displays the model or general form in it's real form. Well-done quality debugging creates good results and it teaches the user how to make better models.

Anotace

Dnešní úroveň komunikace mezi modely a jejich uživateli není příliš kvalitní. Neprofesionální uživatelé nevědí jak správně modely používat. Jejich plnohodnotné využívání by jim však velmi pomohlo neboť tito neprofesionální uživatelé často bývají profesionály ve svém oboru. S moderními technologiemi je možné vytvářet téměř jakékoliv rozhraní, nicméně existují limity v odborných znalostech jejich tvůrců. Naším cílem je identifikovat tyto limity, a stanovit hranice mezi teoretickými možnostmi a účelností. Cílem není dokonalá prezentace modelu, ale především dokonalá komunikace mezi člověkem a tímto modelem.

Key words

Model communication, environment, standards, information and communication technology, 1st, 2nd and 3rd degree mistakes, knowledge systems

Klíčová slova

Komunikace s modelem, rozhraní, prostředí, normy, informační a komunikační technologie, 1., 2., 3. stupeň chyby, znalostní systémy

1. Introduction

The interface is a basic filter. Through this filter man can communicate with his surroundings. The quality of man's understanding/cognition is based on the quality of that filter. Some filters are biological, and some we acquire during our studies, life and so on.
As human development changes, so does the interface. Some of these changes are small, but we try tend to improve our interfaces. Some time ago some interfaces were abusive to individuals barrier seeking for information resources, knowledge of science no matter of the quality of the individual.

We need more than a button presses (like our communication on the internet) in a mathematical model communication.

Communication within a model is still on a low level, we can say that it is a primitive level. It is on the same level as models made by professionals. This is true because the user input data, is the output value that he/she gets after he/she presses a button. These outcome values are usually in a well known form.

2. Goal of the research

The goal of this research is to analyze mistakes, which can happen in feed-in communication between the user and the model. The goal is to find a way to improve the communication environment in ICT (information and communication technology).
Another goal of this research is to find a solution within the communication of a model:

- user friendly
- useful in various kinds of models

3. Methodic

1. Analysis of the best of practices:
   - analysis of existing interfaces of the professional software (STORM, QSB, LINDO)
   - interface analysis of similar oriented products (SAS, COREL)
   - tutorial analysis of professional packets (interaction cover)
2. Conclusions of previous analysis. Classification of the standard used procedures. Creation of meta-methodology.
3. General recommendations and principles of communication between the user and the model. Example of linear programming model application.

4. Results

There are demands for building a model. The user has to be able to communicate with the model or generally with every instrument. The complexity of systems is growing also. So the user has to know these systems, especially know how to use them and know how to read results of computation at the end. So it is necessary to further communication between the user and the model so it can be user friendly as possible. Also so a non-professional user would understand it.

Most of the environments include various instruments throughout the system. The instruments are:

- buttons – there are usually hidden special functions, which are used by a system to e. g. save results, print, start new work/problem, it even acknowledges a user's choice
- windows – it is used mostly to display the system's files structure, supplemental information for user, and help
- dialog lines, windows – used to feed-in data, and show a system's characteristics/parameters

All these instruments are marked by a standard way. Their place is the same or very similar to normal or professional versions. New environments include all these basic instruments of communication in the same form and are based on previous version of the system. They are, of course, included in new instruments too.

Common/universal standards used in communication with an environment are necessary to use in communication with a model. The components, which are typical for model making, used are new buttons, windows, and so on. These components guarantee maximum user-friendly environments for users and demand the user to know about making model.

Communication between the user and the model is bilateral. It is a cardinal part of model and is made as a pseudoactive part. The behavior of the model looks vital, this means, that there is personal access to communication. The model is not based on data, but it is based on knowledge. So there is not a problem about how to display the data, but there is a problem to display knowledge. That is why it is necessary to follow these problems and solve them.

An array of mistakes is possible when making and modifying a model. Any mistake could jeopardize the whole model. There is a requirement to have easy and correct made elimination of mistakes in the feed-in model. So that every part of every new environment displays the model or general form in it's real form.

Feed-in mistakes can be divided into:

- 1st degree mistakes
- 2nd degree mistakes
- 3rd degree mistakes

We can say first degree mistakes are well structured, and are diagnosed, which is why they are easy correct. There are trivial mistakes like typing errors, more than decimal points error, nonattetion. Corrections of mistakes are formal. System should correct mistakes itself, for once the user can.

Vocabularies and lists of terms, which are common used, should make for first degree mistake corrections. This definitely can be said when users feed-in any term. If it is not in the vocabulary or list of terms, this term is corrected automatically. Furthermore, there is given offer of a number of new terms to the user. 1st degree mistakes that are in numeric value can be considered a mistake from the feed-in data in a certain environment. For example: the number 1,200,000 would be in the Czech environment. It would be corrected to e. g. 1 200 000 or 1.200.000. In the Anglo-Saxon environment it is not a mistake, so no change.

3rd degree mistakes are the opposite of the first ones. They are no structured and we treat them as unrecoverable. Nonprofessional users cause them. For example, the confusion of similar terms, misunderstanding requirements of models, typing errors (no decimal point errors), mistakes in logical sequences (e. g. in a farm model: basic cattle herd of the dairymaid, renewal by the new born calf category).

As it was said, 3rd degree mistakes are taken as unrecoverable, but a number of them can be reduced by a question to user. Which is offered to a user after every feed-in terms and data into the model. The question is, is this value/term really right? Do you understand this term right?

2nd degree mistakes are mistakes that are hard to repair. The user detects them during elementary analysis of the model. They can be reduced by well-constructed filter. The filter starts after feed-in data. Corrections of mistakes are content. 2nd degree mistakes can be divided into these categories:

- feed-in numeric value mistakes
- logical mistakes

Examples of 2nd degree mistakes. In the farm model in the matrix structure (linear programming problem):

2nd degree mistake	Text	Item	
		wrong	right
numeric value	number of new born calfs/diarymaid/year	1,55	1,05
logical mistake	new born calfs into heifers and bullocks divisions	52% heifers 58% bullocks	52% heifers 48% bullocks

Numeric value mistake reduction is necessary to make a „vocabulary“ of data intervals. Which are feed-in model by the user. For example basic vocabulary can be the farm. The farm has every typical part of our country, like vegetable production, livestock production. They include common categories (production of crops, …, beef-raising, pork-raising and so on). For all these items there are intervals of values given. There are two kinds of intervals. One interval is for average values. Which can be reached in common conditions. The second one is for values, which are up/down compared to average values, but can be reached in common conditions.

Every feed-in value is automatically compared to values in the value vocabulary of a certain „national“ environment. The national environment in agriculture can be thought of as an environment determined by the production area. Where there is a modeled farm situated. If it is a controlled value in the average value interval, it is not a 2nd degree mistake. The value in up/down average value interval that gives a question to user or warns him, and present a possibility to think about this valid. Out of the possible interval values, the mistakes solved are the same as up/down average values corrections. It is changed in the mistake warning character, and the model should be more aggressive, and compel the user to change this wrong value.

Logical mistakes can be found by an expert system. The expert system should contain metric mistakes. This kind of mistake would by interpreted by the expert system and it would find a way to correct the mistake. It should be a system able to react to each possibility. This means that with in a number of verified models, grows the expert system’s ability to find a mistake. Logical mistakes can be given, e. g. a mistake in one category is divided (usually definite in %) into logical following categories. There it is a lonely element in a model (without any link/attachment), binding conditions are inconsistent and so on.

Communication between the user and the model suggest warning for mistakes. This is based user friendly environment. That is why it is necessary for standard mistake warnings to the user. In standard ways he/she knows. Mistake markings in the model communication is based on mistake markings in the text editor:

- 1st degree mistake – red mark/underline
- 2nd degree mistake – green mark/underline
- 3rd degree mistake – blue mark/underline

Color mistake markings help users in the right model making. It tells him/her clearly what kind of mistake he/she made and how often. Plus, the user is learning too. The user improves his/her model making knowledge and skills.

5. Discussion

Today's level of the model vs. user communication is not very high. Nonprofessional users do not know how to use the model, in spite of this it can help him a lot (because the nonprofessional user is a professional in his job). If something (somebody) exists has to help him with the model outcome reading.

We can do everything with technologies, but there are limits to our knowledge. That is why we have to find the limits of the need and utility. The goal is not a perfect illusion of a model, but it is a perfect communication too, between a man and a model cognition (model use).

The research barrier is to find the right rate between the perfect character display and the perfect communication.

6. Conclusion

In todays level of communication between the user and the model description there is a tendency to have an interface (communication) developed. There is a look of charactestics of interface such as user friendly interfaces and interfaces that have an information tunnel between the user and the model (view of world), not only a filter.

The user should have the possibility to change the model, stop, and finish running the process, and to know what is happening in it. The interface should divide the solving process into cases/points.

ICT is a new possibility for the interface. Words, movements, pictures, and texts can be used there.

Technology or better cyberspace is ideal. Where there are no differences between reality and models, models can be transformed into a virtual reality, because it is only just another form to display reality.

It can now be said the research goal of the work should be:

- multimedia techniques usage in model communication, this suggestion is a new idea
- mathematical models as a invisible part of the decision making, mathematical models in a user preferred form (for example, more graphical, more colored or only a short summary), this is because of the quality of cognition for user, not for his/her comfort
- model „aliving", model would be active, ask questions to itself, offer services, outcomes and the user would choose, the model would be to aggressive. There would be a progression/movement inside.

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