OBJECT NORMALIZATION AND ITS IMPORTANCE FOR ELIMINATION OF CONFLICTS BETWEEN IT AND BUSINESS

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ABSTRACT:
Object normalization has become a common method employed in analysts´ and software engineers´ work. However, according to my opinion we have seen a very little usage of the method for an elimation of conflicts between world of IT and the business world. We see this article as a contribution to solution of this issue and We try to show that object normalization can in deed be used to this task, including practical example. The aim is to guide the reader through object normalization process and show where the respective milestones, i.e. respective object normal forms can be helpful and how helpful can be the whole object normalization process.

KEYWORDS:
objects, object normalization, normal forms, modeling

VLASTNÍ PŘÍSPĚVEK

1. Introduction

The creation of an information system is in its deepest nature a world combining two completely different worlds. The first of those worlds is the computing technology world, i.e. the world based on deep understanding of natural science, on formal mathematization of problems, on rigorous proofs. Informatics employ models and methods that differ greatly from general perception of reality. On the other hand, the world of commerce, of business, it entirely different. It is based on straight perception of reality, much more on intuition than on exact methods. Their abstraction ability is often lower, moreover they see abstraction only as an obstacle to the real work, and the real work itself and its results generate profit which is the main goal of business as such.

In the end it is logical that if those two completely different world communicate, severe conflicts, misunderstandings and confusions occur. The consequence is the fact that considerable amount (ofter majority) of the projects end as a total fiasco – they are either directly cancelled or, even worse, commisioned as a tool which by no means meets original demands and works not as a help, but as a burden for those whose are forced to use it. This massive ineffectiveness causes a great loss to business itself but also to the IT companies and their employees by reduction of their credibility and their further application and also casts a cloud over modern technology in general. The modern technology is not and cannot be the one to blame.

The poor communication is to be blamed. The aim of our professional and scientific interest is to seek for ways of removal of at least mitigation of these barriers, for example by choice of appropriate model transformation 6) or by usage of analogy (4). In this artictle We will try to

outline another of possibilities using object normalization while also using aforementioned transformations and analogies.

This paper is inspirated by book “Objektove modelovani” [2] by one of authors, Vojtech Merunka. The principles used in book are extended in praxis and there is the possibility of usage in communication between business and IT shown.

2. **Use of analogy in communication with a customer**

Object normalization is a technique that is in recent times already regularly used method for modern information systems´ drafts. Through object normalization we have an opportunity to draft the system in a way that is going to eliminate any redundant information which could case serious problems during system running, such as data inconsistency, during which conceptually same data are appearing in more forms, therefore naturally lowering usubility of such systém. Moreover, given larger scale it might case that the information system in question is completely incapable of running.

Object normalization has become of the common methods for information systems´ draft. Its importance was so far limited to the IT area itself (as a purely technical method) without investigation of other possibilities of its usage. We personally believe that object normalization, its consequences and, above all, characteristics of respective object normal forms, can be successfully used as tools of bridging known conflicts between IT and business world, i.e. the world of our customers. In this article We will try to show how this method of work could be used and practically applied. We are purposefully going to avoid more than necessary mathematic and other formalization. The reason to this is the fact that formalization and mathematisation are some of the aspects of the dispute between world of technicians and the world of managers we have to communicate with.

What is it about? The basic principle of the method we are about to use must be the fact that after use of this method it is going to be easy for our partners from the business world easier to understand, for example by the way of making resulting model easily understandable and that we are able to defend so far purely technical approach as a method via which we reach even commercially intriguing aim. It has been already suggested that people used from the world of business are used to only minimal amout of abstraction and require the commucation with them to be free of abstract terms and approaches as much as possible. Instead of abstraction they ask for actual entities and actual processes. Object normalization can when used appropriately provide a tool for such improvement of communication and understanding. We are going to base my article on the statements that may be found in (3):

Object model is specialization of much more general conceptual model,that is why object normalization is specialization of conceptual normalization (1)

This definition says that the objective model is specialization of conceptual model, i.e. is based on that model. Conceptual model is result of an ontological (něco) on the world around us and it is basically a model of concepts (terms) occurring in the real world. By other words – object model is in figurative sense a model stemming for reality, which can be used e.g. my employment of analogy in teaching OOP. If we accept the thesis that these analogies can contribute to easier understanding of OOP by students (which are by unaware of this paradigm, or they know very little), they we can claim that the same principle can be used when communicating with representatives of the business field, i.e. we have the possibility to

use these analogies even here in order to communicate more easily, more effectively, more graphically and more systematically. What is more, not only to communicate, but to understand and consequently on the base of understanding effectively collaborate on the development. Now there is a need to clarify, in what way the object normalization influences an understanding and in what way it can contribute to utilize analogies. If we base the conclusion on the statement (1), then it is immeditiately clear, that object model is specialized version of conceptual model, therefore object model is only a specialization of model derived from reality, therefore an object model can be understood as a simplified model of reality, which truly corresponds with common understanding of the objective model. In the article we are going to introduce practical example of the objective normalization, which we have taken from (1) and we are going to show on this example than superior object normal forms help not only formal structure from IT professional perspective, but they also form reality in a way that is understood by people from the field of business. We are therefore going to show object normalization is not only a purely technical means, but it can also become an appropriate tool for communication with customers. It is however necessary to realize that object normalization can be just of the tools, not the only, all-covering one.

3. Object normal forms – simulation of reality in more phases

In order to work with the objective forms and to show in which way they can be useful for communication with the client, it is vital to set an example which we are going to develop further. As it has been said, this example is based on (1). In this article we have primarily defined two classes representing two important documents – an order and a delivery note.

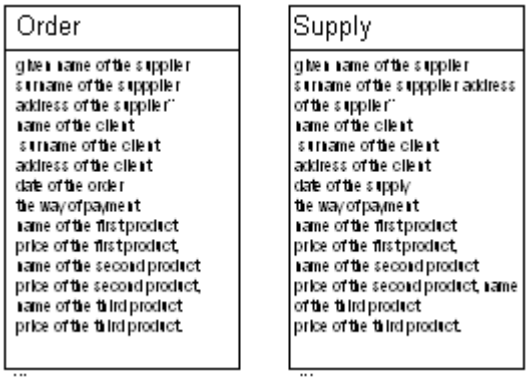

Fig. 1: Scheme before object normalization

It can be seen it is very difficult to work with this scheme not only from the IT professional perspective, but this scheme by no means describe any real structure of the common world. For this scheme it is rather true that it describes two isolated object with no connection to the real world object – these two document are in rather peculiar way emerging „out of nowhere“, as it is visible on fig 2.

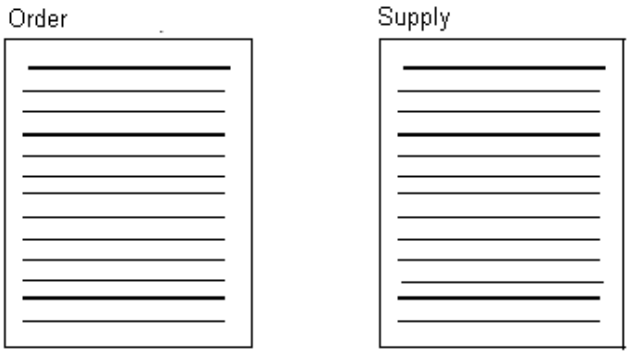

Fig. 2: Real analogy of the scheme before object normalization

3.1 First object normal form

Primarilly we are going to employ literal definition of the first object normal form which describes what characteristics must be met by a scheme of class to say that it is situated in the given normal form

The class in the first object normal form (1ONF) when its objects do not contain a group of repeating atributes. These atributes need to be separated to the objects of a new class and the group of repeating atributes must be replaced by one connection to the collection of the new class objects.Scheme is in the 1 ONF when all classes of objects within are in the 1 ONF. (2)

This defintiion says that in case we find repeating atributes then it is suggesting that these atributes in fact belong to other object (several other objects), which is a part of the original object, or has some association to the original project.

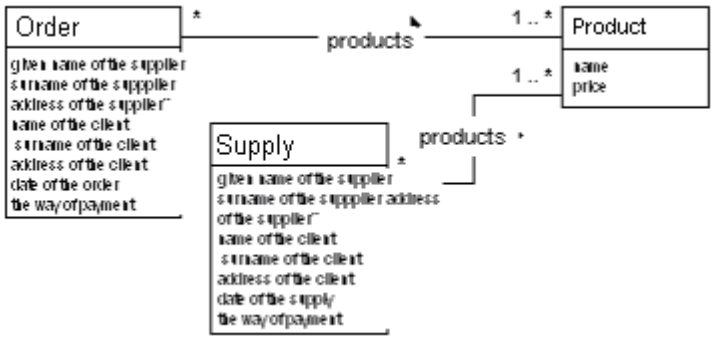

Fig 3: Scheme in the first normal form

In practice the transformation of the scheme to the first normal form is indicated in a way that originally repeating information about products are transformed in a way that the product becomes an independent object. This reflects real perception of the process. Products are in fact real independent entities which can be added to orders and delivery notices, can be removed, their characteristics can be tested. At the same time it is clear that the products exists independenty of existence of an order on a notice of delivery. This rule was not valid for the original scheme and destruction of an order caused also a lost of information of the products as such. Thus the first normal norm separates repeating atributes to independent objects in a way that information of those object exists independently.

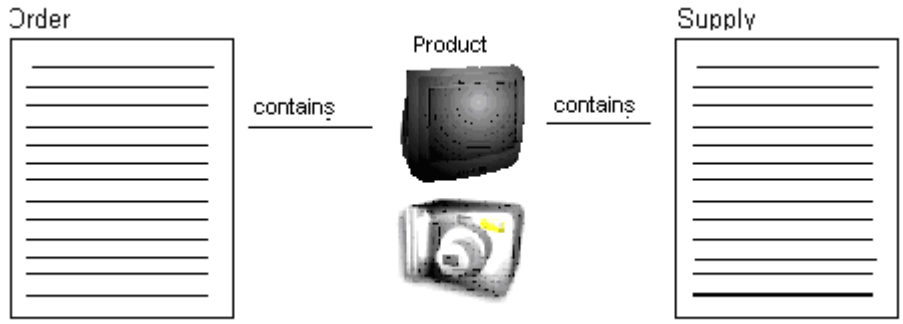

Fig 4: Real analogy of the scheme in the first normal form

3.2 Second objective normal form

Also in this case we are going to start with a definition (1):

The class in the second object normal form (2 ONF) when all of its objects do not contain any atribute or a group of atributes that would have been shared with some other object. The shared atributes have to be separated to a new class object and they have to be replaced by connection to this new class object in all object they appeared.Scheme is in the 2 ONF when all classes of objects within are in 2 ONF. (3)

The second object normal form is therefore focused on situation when two or more objects contain the same atributes. Then it is logica that this atribute does not in fact belong to the object in question, but a part of entirely independent object, existing entirely independently from the original group of objects.

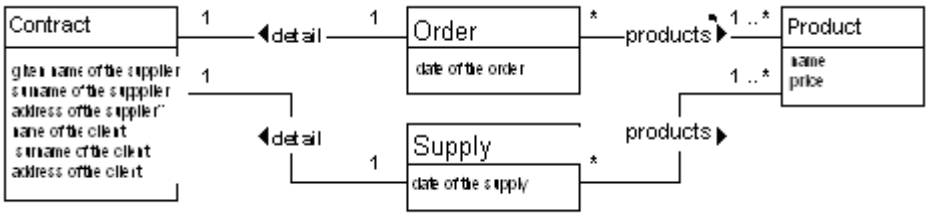

Fig 5: Scheme in the second normal form

In this case it can be seen that the object Order as well as the object Delivery contain entirely the same group of attributes. These attributes are therefore excluded as an independent object with the name Contract. It is an abstract object, nevertheless it is actually used in reality. The terms like “contract”, “business case” and similar occur regularly, despite not being elements that can be really grasped. Nevertheless, we are approaching closer to the real understanding of reality. There is a business case which can be understood as an abstract cover of one business transaction. This business case (in reality the companies are creating separate files for each business case, that is why this is showed in the picture) has its attributes and, at the same time, it contains order as well delivery. Each of those documents then contains a set of products.

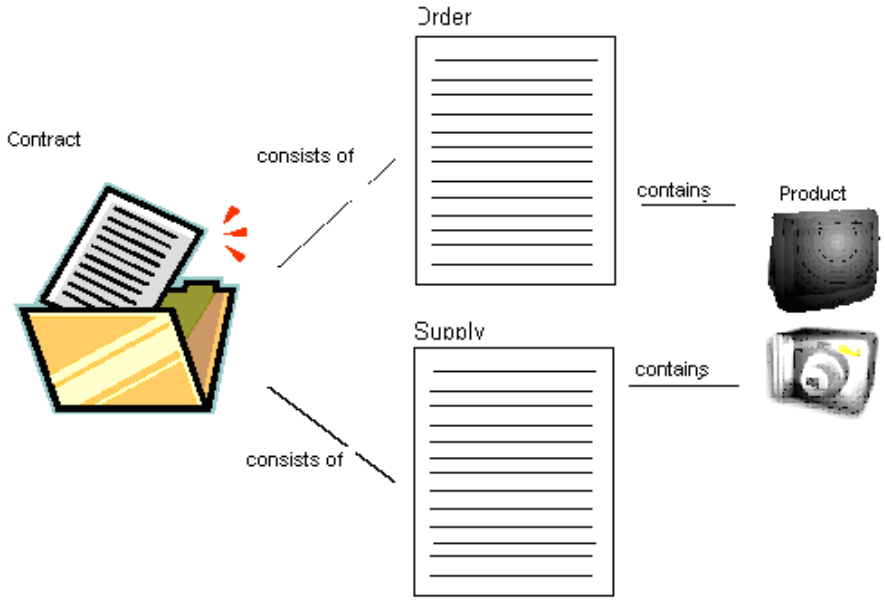

Fig 6: Real analogy of the scheme in second normal form

3.3 Third object normal form

The last of the object normal forms we are going to introduce in the article, is the third object normal form. Similarly to previous cases, we are going to get know the definition first. (1):

The class in the third object normal form, when all of its objects do not contain any atribute or a group of atributes that have the meaning independent from the objects they are contained in. If any such attributes exist, they have to be separated to a new class object and they have to be replaced by connection to this new class object in all object they appeared.Scheme is in the 3 ONF when all classes of objects within are in 3 ONF. (4)

This case is about the situations when object contains attributes having an independent meaning, by other words, which further exist even without the existence of the very object. In this case we divide respective groups of mutually related attributes into separate objects. Therefore, scheme in the third normal form divides the objects in a way that respective objects really covers only those of the groups of attributes which really relates with each other.

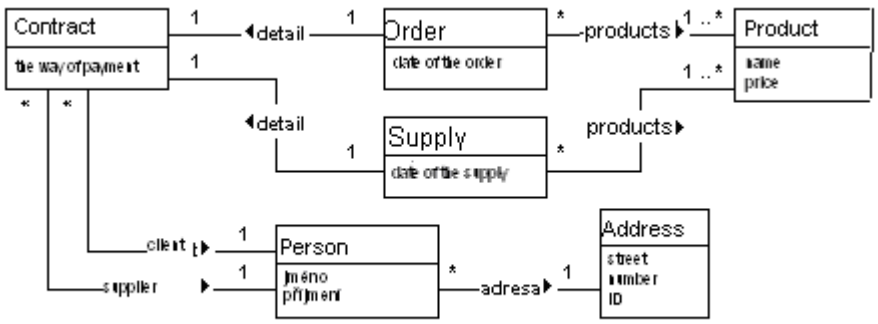

Fig 7: Scheme in the third object normal form

In our case we have focused mainly on the object „Contract“. It has been shown that it containes attributes that are independent from the object given. It is basically information on the respective stakeholders of the business case. Information on persons are definitely independent so we can separate them into independent object. It is further possible to separate from the information on persons their place of residence, because this information exists independently from the persons.

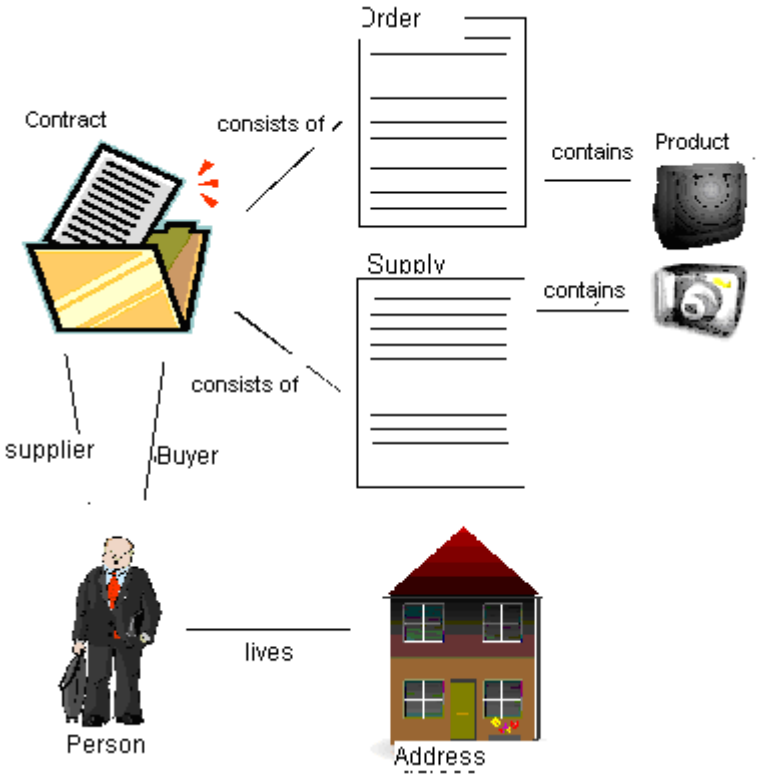

Fig 8: Real analogy of othe object in the third object normal form

It can be seen that the first objective describes relatively well a real situation, which is understood by the worker from the field of business. The basis is „Contract“. There are two persons involved in the contract – buyer and supplier (notice that buyer in one contract can be a supplier in the other contract, they are independent objects). Each person have a given place of residence. A contract is the consisted of the documents and those documents contain information of the particular products.

3.4 An importance of result and an importance of process of objective normalization.

It is essential to stress that important is not only the very result of the object normalization, which gives us a realistic view on object model of the given situation we need to solve, and, at the same time, this model stems from the conceptual model. The process has its importance as well, during it we can, alone of with the client, gradually go through respective steps which clarify and justify the resulting structure. This justification is relatively important for the business people, because it gives them the option to understand principle of the software creation, but also to understand the reason, why the structure is the how it is. Naturally, the main reason is the linkage to conceptual

model, i.e. the real world we are trying to describe and implement in the form the particular system.

4 Conclusion

In the article it has been shown that the object normalization is not a merely technical tool used for drafting and modeling of information systems structure, but that this tool may also be used as a means of bridging really existing barriers between IT world and the world of business. These barriers are recently being discussed since they are at least contributing cause of situation when more than half of the projects are evaluated as unsuccessfull. This is not a situation which is sustainable in a long term. Each tool, including object normalization which could eliminate of at least ease (here are my ambitions from the object normalization perspective), is surely going to welcomed in practice. For practical usage it is going to be essential to further deal with the issue, both on theoretical and on practical level. It going to be necessary mainly to use reasonable methodology of model transformation to conceptual, better reflecting reality, models.

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