



Management of eco-innovative selected methods for the identification of the problem in universal design

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ABSTRACT

The purpose of this article is the analysis of selected methods for identifying the problem in universal designing. This analysis was done on the basis of researched Viennese stop at territory of Poznan. Design problem was defined in the article. Identification of problem and universal designing was referred to. The following identification methods for problem were analysed: Ishikawa Diagram, 5X Why and QUINTILIANUS Method.

Keywords: design project, identification of problem, universal designing, method

1. INTRODUCTION

Two speeches of renowned researchers are provided as justification, why this concern was taken into account as topic of this elaboration among others. “Central point of interest in design area for researchers is currently design problem and operationalization of the sole problem. Here, direct relationship of designing and science is seen, that also begins with problem. Cognition does not start from perception, collection of data, but from problems.

There is no knowledge without problems - there are also no problems without knowledge” “Einstein said, that when he would have an hour for solving a problem, on which his life was relied on, he would spend 45 minutes for formulation of problem, 10 minutes for verification whether it was properly formulated and then 5 minutes for the solution”.

Identification of problem in the sole design process is represented at Figure. 1. It can be concluded, that formulation of problem and its analysis comprises small part of process, but it is of undoubtedly key importance.

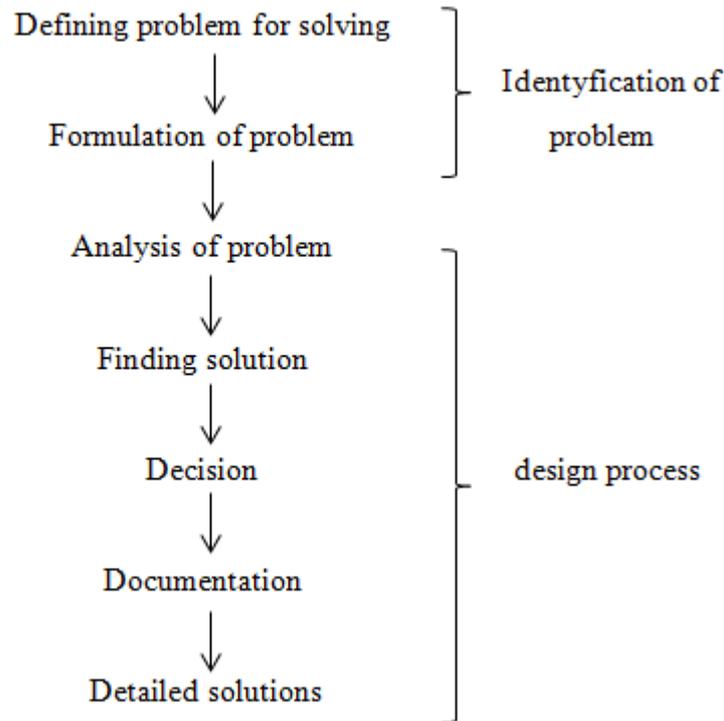


Figure 1. Design process.

2. RESEARCH SUBJECT

When referring to the identification method in the universal designing, researches at Viennese stops in Poznan were conducted. Three Viennese stops at Gwarna, Łąkowa and Plac Wiosny Ludów stops were analysed.

Austrian engineers developed the stops. The solution was inventive in such a scope, that it was adapted in various cities of the world. Authors focused on rising the roadway area up to the level of pavement and tram stop. The general purpose of this was the increased level of safety for tram travellers and pedestrians awaiting for tram with application of so called speed bump. Viennese stops should be designed for the length of one tram vehicle. Moreover, pedestrian crossings can be introduced nearby the stop, that exploit the slowed motion provided by the rising, as well as lowered driveway and chance for safe crossing by pedestrian to the opposite pavement lane. Easier getting in and out from tram for elder people

and for those with lowered motoric capabilities with means of decreased and equalled difference in the levels between the stop and tram is supplementary function of stop.

Stop was designed according to the principles for universal designing, this is:

- **Principle 1 Identical application** is based on the equal accessibility for all users of items and space. Designing enables the use by all disabled people without the need of modernization.
- **Principle 2 Elastic use** takes into account such user needs, as the chance for selecting the method of use for particular space or item.
- **Principle 3 Simple and intuitive use** concentrated on designing the space and items in such a manner, that it is understandable for the group of users without regard to their individual and personal characteristics.
- **Principle 4 Perceptibility of information** is based on the accessibility of information via visual, sound and touch information.
- **Principle 5 Tolerance for faults** is generally oriented on the creation of safe usage conditions for designed space or item.
- **Principle 6 Low level of physical exercise** puts emphasis on such designing of space or item, that its use is friendly and comfortable and, above all, it does not cause excessive physical exercise.
- **Principle 7 Dimensions and space for access and use** is connected with the aspect of usable space adapted to the users needs.

3. METHODS USED IN THE RESEARCHES

General concern was identified and referred to the violation of traffic regulations by stop users. These are first solutions in the city of such type. Stop is located at only one side of pavement and there is no stop on the opposite side. Street is surrounded by shop lanes at both sides and it is a street with intensified pedestrian, vehicle and tram movement. Principle for stop use is such, that when tram vehicle stops at tram stop, such person has right of entering to driveway area and can relocate to tram.

People leaving tram shall immediately leave driveway area via the shortest route. Their further movement is possible only at pavement part. The use of driveway zone for shortening the route oriented on the relocation to the opposite pavement lane is forbidden. At time of observation it was seen, that considerable amount of passengers does not comply with such rules. Travellers habitually await for tram arrival at driveway, as well as relocate alongside driveway and often use it for crossing to the opposite traffic lane. Traffic cones are also anticipated in the stop construction, that separate the lane designed for move from the lane designed for trams. At the same time, they have warning function for drivers and prevent from threats connected with irrespective entry to stop-driveway part (instead of pavement). It was observed that drivers are disoriented and do not comply with traffic regulations when driving through the stop.

The concern is, that stop is being omitted and drivers select driving through the part designed for trams, what is improper and pose additional threat.

Four methods, 5xWhy, Quintilianus and Ishikawa diagram and functional analysis, were used for proper definition and detailed identification of problem. Several methods were used to provide complementarily defined problem.

a) 5xWhy method

Solving a problem and introducing the effective corrective action requires the identification of cause, namely why the problem has occurred. When we do not identify and remove it (only remove the occurred discordance, instead), we can be sure that another occurrence of problem is only a matter of time. Thus, the identification of factual cause of problem and its removal is very important, in order to prevent another occurrence of problem. 5 Why method is one method determining the problem cause, among others.

- **Why** traffic regulations are violated at Viennese stop?

Because people are not aware that they violate them.

- **Why** people are not aware that they violate them?

Because they were not informed about it.

- **Why** they were not informed about it?

Because Principal has not regarded it.

- **Why** Principal has not regarded it?

Because it can be additional investment cost, that was very expensive.

After the analysis with means of selected method the conclusion is, that violated traffic regulations at Viennese stop are not direct problem. General problem is lacking will for extra pay for the investment and conducting informing campaign.

b) QUINTILIANUS method

This method was created by Ancient Rome thinker, Quintilianus, who left a set of questions, that were adapted by him during the recognition of new problems. There are seven questions and cover the extent of: who, what, where, why, how and when, with gradually extracted essence and weight of problem. Consideration in any 28 possible combinations points out the problem, its essence, as well as possible extent and solutions. It should be remembered, that in the combination of such questions, the response to many questions can be not so easily found out at particular stage of problem identification.

Table 1. Problem developed with means of Quintilianus method Source: Own analysis

ho?	subject	City government	1-2	1-3	1-4	1-5	1-6	1-7
hat?	Object	Viennese stop	2-3	2-4	2-5	2-6	2-7	
here?	Place	City centre	3-4	3-5	3-6	3-7		
ith what?	Means	City budget	4-5	4-6	4-7			

Why?	Purpose	Improvement and increased safety of citizens by adaptation to traffic regulations	5-6	5-7
How?	Methods	Informing boards	6-7	
When?	Time	At nearest convenient time		

The simplest combination of Quintilianus questions was presented above, that clearly stipulated the purpose and problem to be solved, when referring to Viennese stops. The response to the questions systemizes basic knowledge for the problem.

c) Ishikawa diagram

Ishikawa diagram, that is very often simply called the fishbone diagram, is a chart with cause-effect character. Ishikawa diagram is a method for solving problems. It is developed with purpose of graphically presented dependents existing between the causes leading to the occurrence of analysed problem and the effects that result from it ¹.

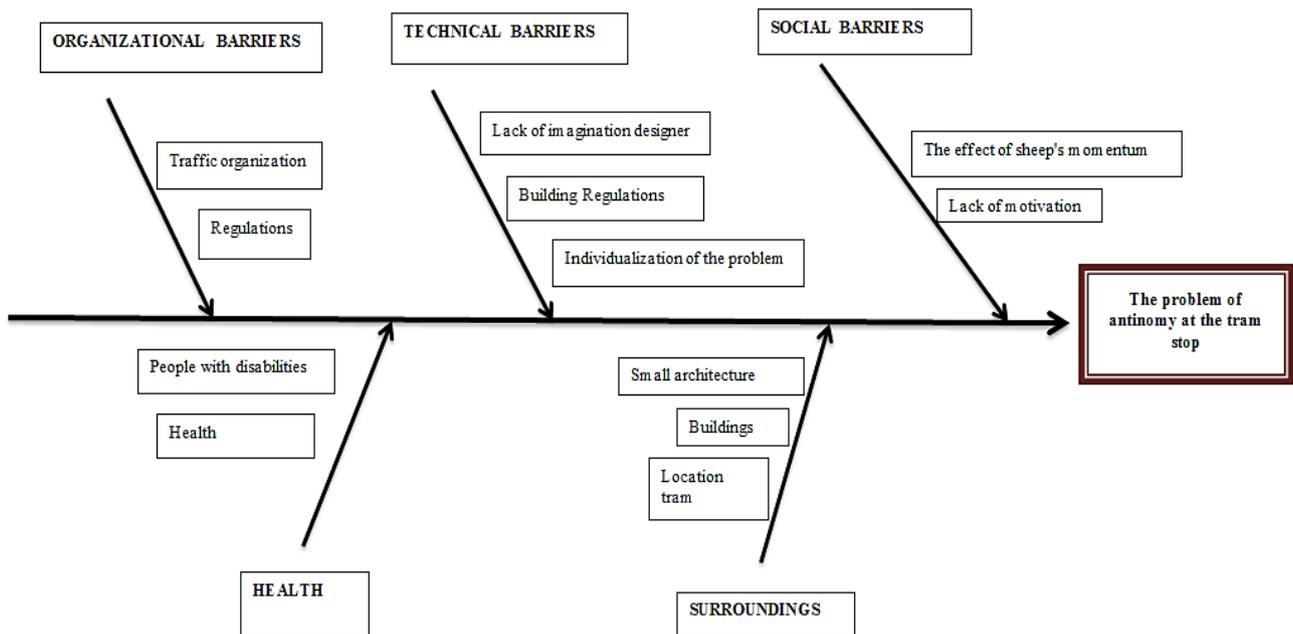


Figure 3. Ishikawa diagram of the problem. Source: Own analysis

¹ <http://www.educational-business-articles.com/fishbone-diagram/>

The result of analysis is the fact, that problem can be identified with means of following five barriers: organizational, technical, barriers health condition and surrounding. The influence on the presented technical and organizational barriers can be law regulations, in general. Lacking motivation and stampede effect influence on social barriers. Health is shaped by disabled people and general passengers health state. Development, localization and small architecture at territory influence on the surrounding. The stipulated barriers do not comprise full picture of causes for problem existing at Viennese stop. They can comprise general problem outline, but causes can be found also at deeper layers.

4. CONCLUSIONS

The summary of elaborated topic can be covered in three general conclusions:

- Proper identification of problem is much more important than the selection of methods for solution.
- Problem identification requires the same creative work, as its solution.
- Irrespective identification of problem leads to the solution for other problem, instead of the assumed one.

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(Received 29 September 2016; accepted 10 October 2016)