1.2 Goal model[1]

Document purpose

The purpose of this document is to guide the assessor and project provider in creating a goal model as part of the second step of the educational impact assessment method: Create goal model. The goals that are modelled in this step are identified during the previous step of the method, which is called Define project goals.

The goal model is made with the use of GoalML. GoalML is a modelling language which is very elaborate. However, only a specific set of functionalities is used for the goal model that will be created during this impact assessment. This document provides a step by step explanation of how to create a goal model with GoalML. Furthermore, an explanation of the semantics of the modelling language is given.

The GoalML specification is derived from Köhling (2013). Also, the various shapes and symbols are derived from Köhling (2013), or are created using the MS Visio Template.

Tool support

Creating a goal model using GoalML can be done using MS Visio. A GoalML template, which can be implemented in MS Visio, can be used in order to have access to the relevant icon set. The name of this document is GoalML Template, and can be found in the SupportDocsIA folder.

If you do not have access to MS Visio, you might also be able to implement the template in another free modelling tool (e.g. Lucidchart), or draw the model on paper.

Creating a goal model

In order to create a goal model, first a set of project goals need to be in place. In the previous step of the impact assessment, such a list of project goals is composed. These goals can be split up in two different types of goals: Engagement goals, and Symbolic goals.

An engagement goal is visualized with the following symbol, and is used for the

[1] This document is a component of the Impact Assessment Method which is developed as part of the Master's Thesis of M.J.M. Smulders - Situational Method Engineering for ICT4D: Performing Impact Assessments for Educational Programs - at Utrecht University, in collaboration with Maxim Nyansa IT Solutions (2020).

visualization of specific goals, which can directly be measured using specific metrics. In other words, an engagement goal is a goal of which the desired result is quantifiable. An example of an engagement goal is “decrease risk costs”.

A symbolic goal is visualized with the symbol below. With symbolic goals are meant, goals where no specific metrics can be defined to measure that specific goal. In other words, a symbolic goal is a goal of which the desired result is not directly quantifiable and includes a qualitative aspect. An example of a symbolic goal is “increase customer satisfaction”.

Therefore, the first step in creating a goal model is the following:

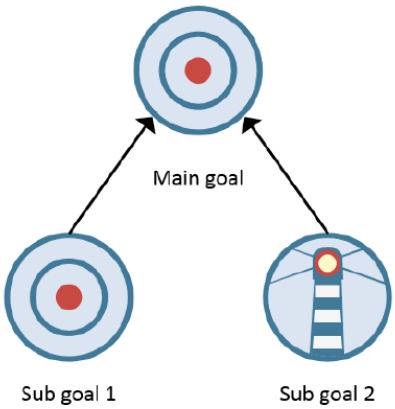
1. Divide your set of goals in engagement goals and symbolic goals.

After that, relations van be drawn between the goals. In most cases, there are different levels of abstraction in the set of goals. One goal might be the main goal of a project, with other goals being supportive of this main goal. It can also be the case that there are multiple main goals in place. The second step is as follows:

2. Create a goal structure with different levels and relations.

In order to do this, the main goal(s) should be identified. After that, the goals that directly support this main goal should be connected with an arrow. An example is shown in the

figure below.



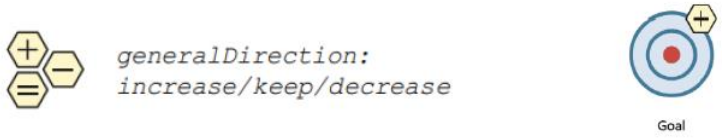
If all the goals are structured in this manner, the result will be a model containing all the project goals that were identified earlier.

Then, there are some specific small symbols that can be added to the various goals. Each addition will be explained here. The addition of these small symbols can be useful, but are not a necessary addition for every goal. Therefore, these symbols only need to be modelled if it has added value to the model.

The final step in creating the goal model is as follows:

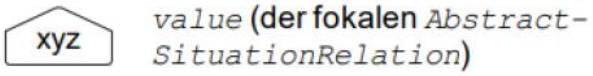
3. Model additional features to each project goal.

The first addition is the generalDirection. With this, it can be indicated if the goal has the aim to increase, decrease, or stay the same. For example, if a project goal prescribes to improve the number of computers that are available in schools. The goal has the aim to increase this number. In that case, a + sign can be added in the top right of the goal. If the goal is to decrease, a – sign can be added to the top right of the goal. And if the goal is to keep something equal, the = sign can be added. How this is done is shown below.



Another important factor in the goal model is the addition of targets. For every specific

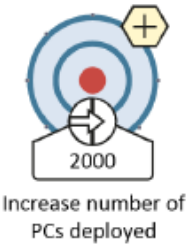
goal, a value can be described. This value defines the numeral target for the specific project goal. This target can be defined with a white box below the goal icon like shown below. It is of great importance to add a target value if these are defined. These values can be used to indicate the progress of the impact that has been made by the project. The block as seen below is used to indicate this value.



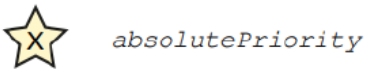
Together with such a target value, it should be indicated if the value should be achieved once at a time (en-bloc), as a minimum (satisfy), as exactly that specific value (exact), that the value should be maintained (maintain), or that the value should be improved upon (improve).

The different values of the value van be visualized with the following icons:

This can be applied in the model as follows:



Lastly, it is possible to give some goals a priority. Therefore it can be the case that some goals need to be achieved before others. Priority can be indicated with a star shape, including the number of priority (with 1 being the highest priority). The visualization for this is as follows:



Furthermore, this can be visualized in the model as follows:

There are plenty more options to expand the goal model with. However, these are not necessary for the purpose of this impact assessment method. However, you are free to implement additional shapes as explained in

References:

Köhling, C. (2013). Entwurf einer konzeptuellen Modellierungsmethode zur Unterstützung rationaler Zielplanungsprozesse in Unternehmen. Cuvillier Verlag.