Abstract

In a dynamic world static models are probably not sufficient for the more complex simulations. This is the reason why this literature review is made to see if there are new techniques which can be included in the DSA to model even more complex systems. The Delft System Approach (DSA) is an ideal method of modelling on a fast and effective way static and well understood problems. Because the DSA makes smart use of black-boxes and can easily zoom in or out in the different strata. But when a more detailed model is needed of a complex system with dynamical behavior the DSA is pushed beyond its limits. This is where the possibilities of Agent Based Modelling (ABM) are fully used. This is a modelling technique based on agents, the functions, which have contrary to the DSA possibilities to cope with a dynamic structure behaviour and decentralized control. When the agents are defined right possible solutions can emerge as a result of the reactions between the different agents with these results the best direction for the system to develop is determined. To visualize this, these results are often plotted in so called fitness landscapes; these can give an insight in how the most feasible solution was picked.

For the static models, this solution will be the same found with the DSA, but when the system is complex an unforeseen, by the modeler, solution could emerge. This is because of the limitations a modeler has. The model and also its solution can't be more complex than the user.

The main goal of this literature review is the search for papers in which complex systems are modelled with the use of ABM and to find out if these systems are more complex than the ones that can be modelled with the DSA This will hopefully open the eyes of the users of the different paradigms because visions and techniques that give the modeler more possibilities or the possibility to model something which was impossible to model before are always good.

After a summary of the DSA and ABM technique three papers are discussed thoroughly and conclusions are drawn from these papers. The conclusion reached is that the DSA is a well defined technique with a logical definitions system but that some of the conclusions are based on outdated sources. Secondly ABM is has a few techniques with great potential but because it is used in many different research field the definitions are scattered thus ABM could learn from the DSA. But the techniques that have potential could be implemented is the DSA and this will enhance the modelling paradigm. Conclusion; ABM has potential and the user of the DSA could benefit from this.