

SOCIETAL PROBLEMS MORE COMPLEX THAN PRESUMED: THE COMPRAM METHODOLOGY

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Abstract

Complex societal problems are often wrongly addressed by politicians as mono-disciplinary, relatively easy to solve problems. By directly jumping to conclusions politicians overlook the complexity of the problems in their decision making process. Complex societal problems are generally interdisciplinary problems and should be addressed in a multi-disciplinary way considering the multiple actors and their interactions, the many variables involved, as well as the emotions that the problems provokes. These many interactions are the cause of the complexity of the problem handling process. It is high time that complex societal problems are addressed by the politicians in the right way using the methodology, methods and tools of the field of Methodology of Societal Complexity so the problems can be handled in an adequate, transparent, efficient and proper way, mitigating the damage the problems are causing. The field of Methodology of Societal Complexity developed ways to guide the problem handling process of complex societal problems for analysing, decision making and implementing interventions in an adequate, democratic and efficient way. The Compram methodology is a major methodology in this field and directs in a structured, democratic, and efficient way, the problem handling process of complex societal problems by using a multi-disciplinary, multi actor approach including emotional aspects. The OECD (2006) advised governments to handle complex societal problems that threaten global safety according to the Compram methodology. The universities should include issues of the field of Societal Complexity into their disciplines so that future managers are aware how complex societal problems should be handled.

Keywords: Societal complexity, Compram methodology

1. Complex Societal Problems

Complex societal problems are problems often mentioned on the front page of quality newspapers. There are local, national, continent wide and global complex societal problems. Local problems centered in a geographic area

include traffic jams and road design, hurricanes, tsunamis and pollution. National problems such as the organization of healthcare, and educational programs affect larger areas and more individuals. The distribution of resources such as water and energy are more often continental problems, and

examples of inter-continental problems include the migration of refugees and asylum seekers, spread of diseases such as bird flu, terrorism, financial credit crises and climate change. Most of these problems threaten the local or global safety and the quality of life for large numbers of individuals. These problems also require government and inter-government interventions, and thus become political problems at all levels, including the local organizations and the international organizations like the G7, G20¹, OECD, and the UN.

Complex societal problems have often been treated as mono-disciplinary problems, such as logistic problems, economic problems, healthcare problems, agricultural problems, technical problems or legal problems. However, complex societal problems contain a combination of aspects studied in several disciplines, and therefore they are interdisciplinary problems. Interdisciplinary problems cannot be handled as mono-disciplinary issues, because that approach misses aspects of other disciplines that are involved in the problem. Handling a complex societal problem as a mono-disciplinary problem misses the complexity of the interaction between the aspects of the different disciplines, and the different variables which make the problem complex, and makes handling the problem complicated. Not only are many disciplines addressed in dealing with complex problems, but

also many actors² are involved. Each actor has a different kind of problem. These actors interact with each other in an often unpredictable way provoking a lot of emotion. Therefore complex societal problems should be handled in a multi-disciplinary and multi actor way, referring to the knowledge, power and emotional aspects of the problems.

Some examples of complex societal problems that have been wrongly defined as mono-disciplinary problems, are defining the HIV/AIDS problem in 1984 as a healthcare problem (DeTombe 1994)³, defining the credit crisis as an economic problem (credit crisis of 2008); and defining the refugee problem in Europe of 2015 as a legal problem. Defining the problem directs the way the problem is subsequently handled. Defining a problem as mono-disciplinary one directs handling a problem in a mono-disciplinary way. When a complex societal problem is handled in a mono-disciplinary way, the problem handlers propose unsatisfactory approaches to its handling. Often politicians presume they know how a problem appears, and jump to conclusions about handling it, without taking enough time to really consider its true nature. One should take the time to define the problem first otherwise it can result

¹ The G7 is the meeting of the finance ministers of a group of seven industrialized nations Canada, France, Germany, Italy, Japan, United Kingdom and the USA. The G20 is the assembly of the major economic countries, these are the above mentioned countries and Argentina, Australia, Brazil, China, India, Indonesia, Mexico, Russia, Saudi Arabia, South Africa, South Korea, Turkey and the European Union.

² In this article we use the word actor to indicate a certain group of people who have a specific interest in the problem. We do not make a distinction here between the words actor, stakeholder or party.

³ The HIV/AIDS problem was regarded as a healthcare problem during the period of 1984-2000, and, based on this definition of the problem, almost all the research money and help programs were directed to the field of healthcare (DeTombe 1994). After 2000, the HIV/Aids problem was recognized as a complex societal problem, and a different approach was taken towards the problem including many aspects of society.

in handling the wrong problem. This can be counterproductive such as emphasized by Ackoff in what he calls a problem of the third kind (Ackoff 1978). The first description of the problem often only contains one or two aspects of the problem, however after reflecting longer one can see that the problem is more complicated than it seemed on first view. Before formulating changes, a considerable amount of time and effort should be spent to define the problem. Therefore much emphasis is on the first sub-cycle of the problem handling process (see Figure 2). Unfortunately, this sub-cycle of defining the problem, is often neglected or only considered at a very shallow level.

All complex societal problems are man-made problems, which means that the actions of human mankind are the cause of the problem. Even problems caused primarily by nature, like hurricanes, avalanches, floods and tsunamis, become man-made complex societal problems, because, although nature itself can do the harm, human activity has complicated the environment. For example, when people build houses in vulnerable flood areas like the deltas in Bangladesh, they set up the possibility of a major human disaster. Likewise, building a nuclear power plant near the sea side in an earthquake vulnerable area like that in Fukushima in Japan⁴ provided additional serious complications to an already hazardous situation. Another example was the poorly constructed and inadequate dykes built to protect parts of New Orleans which failed with horrible consequences following Hurricane

Katrina in 2005. Similarly, the clearing of mountainside forests to construct ski areas and houses have been the cause of disastrous avalanches and mudslides that created human misery⁵. Figure 1 below summarizes the general definition and conditions of a complex problem.

2. The Field of Methodology of Societal Complexity

Realizing that there was no specific scientific field that directly addresses complex societal problems DeTombe created in 1994 (DeTombe 1994, 2001a, 2001b, 2001c) the field of Methodology of Societal Complexity. The goal of the field of Methodology of Societal Complexity is to extend and to create methodologies, methods and tools to support the policy of handling complex societal problems. An international interdisciplinary research group⁶ is working on this theme. The means to reach this goal include the yearly organizing workshops and conferences, and publishing proceedings, articles and books on this topic.

In the field of Methodology of Societal Complexity, the concept 'solving' is replaced by the concept 'changing', because often a solved problem for one actor is the start of a problem for another actor. Thus 'solving' depends on which side are you on. The changes in the problem can be towards one of the desired goals of a certain actor and against those of another actor. So it is preferred talking about changing a problem instead of solving a problem.

⁴ A manmade local threat was the triple disaster in Japan in 2011. The local earthquake caused a tsunami and the melt down of the TEPCO nuclear plant in Fukushima Japan (Volkskrant 2013).

⁵ Avalanches in Austria in 2008 due to cutting down trees on the slope of the mountain (Apeldoornse Courant 2008, De Telegraaf 2008).

⁶ See <http://www.complexitycourse.org/detomberesearchgroupallsall.html>.

A complex societal problem is a real life problem, which has a large and often different impact on different groups of society. The problem has often an impact on all levels of society, on micro-, meso- and macro-level.

The problem can be in the present or in the (near) future, latent or manifest, structural or incidental. The problem can be urgent or less urgent.

It is often difficult to become aware of the problem. It often seems that the problem suddenly 'pops-up'.

The future development of the problem is uncertain.

The problem is often undefined or ill-defined. The problem is dynamic; it changes during its development and is imbedded in a dynamic environment.

The problem has knowledge, power and emotional components.

The problem is interdisciplinary: the problem concerns many domains. Often there is a lack of knowledge, the data are incomplete, uncertain, in contradiction with each other or only partly available.

The problem consists of many phenomena which are complicated and intertwined and in which non-linear feedback loops are producing unpredictable results.

There are many actors involved. Each actor has a different view on the problem, a different definition of the problem and has different goals and desires. The actors often have different 'solutions' for the problem. The different actors involved have different power over the problem.

The problem often provokes much emotion in society.

The desired situation is not always clear and difficult to find and differs from actor to actor. A 'solution' is not easy at hand. These problems can mostly be only partly and/or temporarily solved, and can seldom be solved completely. A complex societal problem cannot be solved only be changed.

The problem is unique and never handled before in this way.

Due to the many aspects of the problem, the uniqueness, the interdisciplinarity, the complexity, complex societal problems can be considered as difficult to analyze, to define, to interfere and to change, therefore it is difficult to handle complex societal problems.

Figure 1 Definition of a complex societal problem (DeTombe 2015)

Each complex societal problem has a knowledge component, a power component, and an emotional element. At the start of the problem handling process the knowledge issue should be addressed. Something is known about the problem, enough to put it on the political agenda, but the problem is not completely defined and one should realize that a lot more knowledge about it is needed. The power component is in the hands of actors. Many

actors are involved and they have their own power, their own definition of the problem, their own desired goals, knowledge and emotions. Complex societal problems usually provoke a lot of emotions. They have different effects on different actors some of whom benefit, while many suffer. Often the benefits are privatized and the costs are socialized. Throughout the whole problem handling process emotion is involved. In handling a complex societal

problem one need to understand and be sensitive to the reactions of the problem handlers towards each other, as well as to the emotional reactions of the people involved towards the problem and the proposed changes⁷.

3. Handling a Complex Societal Problem

A complex societal problem should be addressed adequately so to mitigate the amount of damage to the people and the nature, and not too much time, money and resources are wasted. A problem owner, a person from the government, or the CEO of an international organization, is a person that has or gets the legitimate right to handle the problem, including implementing possible interventions. The problem owner delegates the problem handling process to a facilitator or a group of facilitators who handle the problems based on the authority of the problem owner. The definition of problem handling is:

Handling a problem is the process of analyzing, defining and/or changing a problem in order to gain

⁷ In 2001 DeTombe (2001a, 2001b, 2001c) published about these three basic aspects of complex societal problems about the same time in P. R. China another scientist Xuesen Qian (1911-2009) (Hsue-Shen Tsien) (Qian et al. 1990) came to the same conclusion that complex societal problems contain knowledge, power and emotion. Qian did not use the term complex societal problem, the name DeTombe used, but talked about meta-synthesis however this indicates the same kind of problems. Publishing articles in different languages, in Chinese by Xuesen Qian, and in English by DeTombe, the researchers were unacquainted with each other's work. This lasted till 2004 when DeTombe got an invitation from the Chinese Academy of Science by Prof. J. GU (Gu 2015) who is working on basic of the scientific work of Xuesen Qian. See also Longbing (Cao 2015).

more insight into the problem, whether or not this leads to influencing the problem in order to reach a certain desired situation. This process can be performed actively or passively, consciously or unconsciously, routinely or once-only, whether it is by circumventing or by forgetting the problem, by shifting the problem to another party or by (partly) changing the problem, by imagination or in real life, whether through thinking, applying tools and/or methods.

Several phases can be distinguished in the problem handling process. In the field of Methodology of Societal Complexity two sub-cycles and twelve phases of the problem handling process can be distinguished (see Figure 2). The first sub-cycle of the problem handling process is about defining the problem, the second sub-cycle is about changing the problem⁸. Although the phases of the problem handling process are shown in Figure 2 in a linear view, in essence the phases are not as linear as shown here. There can be feedback loops between the phases, and the two sub-cycles more often operate in circular fashion. This means that after finishing the second sub-cycle of the problem handling process, the problem handling process often has to start over again now with a somewhat changed problem. This can be an ongoing process.

⁸ The phases are described in more detail in DeTombe, 2015.

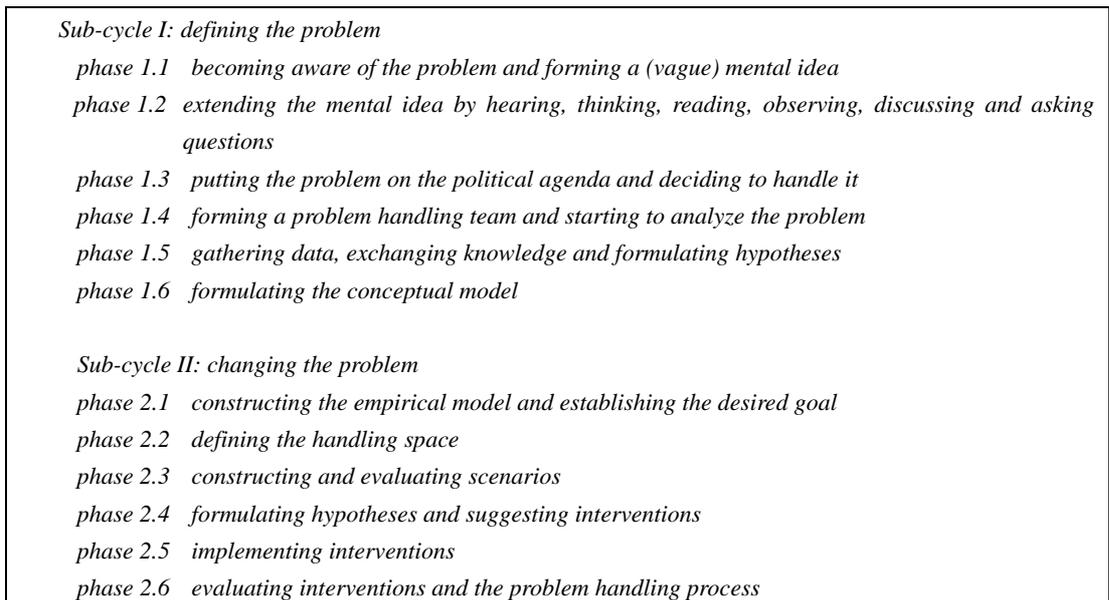


Figure 2 The sub-cycles and phases of the problem handling process in linear view (DeTombe 2015)

In order to start handling a complex societal problem one should be aware of the problem. This is not always as obvious as it seems. Often complex societal problems are not noticed, like the onset of the refugee problems in Europe in 2015 (Blokker & Chorus 2015) and the beginning of the HIV/Aids problem in 1984 (DeTombe 2015, Shilts 1986, 1987), or just not perceived as complex societal problems because they are described as the 'culture'. For example, the suppressed position of women all over the world is often disregarded or explained as the 'way it is'. Likewise, victorious soldiers frequently express their aggression towards the conquered women and children by raping them (DeTombe 2014). When people find a problem interesting, important, or urgent enough, they can reflect on the problem further by finding data on what is known about the problem, describing the problem, determining who are suffering due to this problem and who are

benefitting from it, and thus determining the actors involved. Based on these discussions and reflections it is possible to consider what to do about the problem. When it has been decided that something should be done about the problem, the problem should be placed on the political agenda of a relevant and recognized problem owner. As mentioned above, a problem owner has have credibility, and has to have the legitimate authority to handle this problem.

Not all complex societal problem can be handled. It is very hard to put a problem on the political agenda when it is not in the direct interest of the politicians. Putting a problem on a political agenda depends on the political impact of the problem. Is the problem in the political interest of the politician? Can he or she benefit politically from it? Does the problem belong to the normal tasks of the government? Is the problem a threat to the safety of the country (such as terrorism), or a threat to the status of the

political party?

When a problem is not put on a political agenda, the problem often cannot be addressed properly. There is no money, and no power to make the changes needed for changing and implementing. When a group of persons want something to be changed in a society, and, if the politicians are at this moment not interested in it, the group has to take action to bring the issues to the attention of the public and the politicians. This can be done by an action or a lobby group. Sometimes one has to do a lot of lobbying, or

even organize public demonstrations to develop enough pressure on the politicians to put the problem on their agenda. Once the problem has moved onto the agenda, the politicians can decide how to address the problem. Addressing a complex societal problem is best done by following a proper methodology from the field of Methodology of Societal Complexity such as the Compram methodology. The Compram methodology can start after the problem owner has decided to handle the problem (problem handling phase 1.4 - 2.6 see Figure 3).

Compram Methodology:
 and phases of the problem handling process

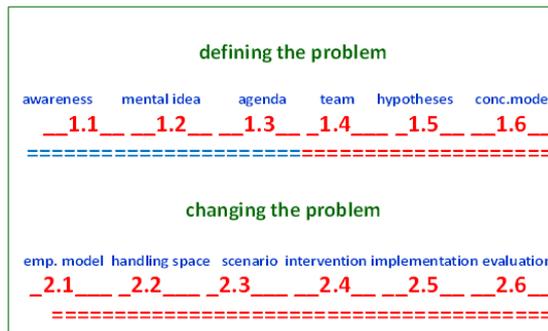


Figure 3 The Compram methodology and the phases of the problem handling process (DeTombe 2015)

4. The Role of the Facilitator

Often even complex societal problems are analyzed and handled by only a small group of mono-disciplinary people who make, at the request of the problem owner, a model of the problem and present this model back to the problem owner, who then can base his or her political decision on it. However complex societal problems are interdisciplinary problems, this means that they have aspects studied in several scientific fields. Therefore societal problems must be handled cooperatively in a multidisciplinary way by experts from different fields. Complex societal problems usually have

a large impact on society, and usually have multiple impacts covered by several fields of study; affecting on micro, meso- and macro levels of the society. Many actors and groups of actors are involved in the problem, and, therefore, in a democracy, the problem handling process must consult representatives of all principal actors and groups. The field of Methodology of Societal Complexity emphasizes that complex societal problems should be handled in a multidisciplinary fashion with experts and with the cooperation of the actors. This creates a difficult and complicated group handling processes. These group

processes must be guided and structured by a facilitator. The facilitator guides the problem handling process based on the authority of the problem owner in a neutral way, this means that the facilitator should be neutral towards any kind of outcome of the problem handling process. The task of the facilitator is to see that the problem handling process is performed adequately, democratically and efficiently. It is the task of the facilitator to ensure that all participants of the problem handling process can be heard and that the participants understand what they are talking about. The task of the facilitator is to see that all the information of the group processes is stored, available and kept for later use if necessary. The task of the facilitator is also to see that the emotions in the group handling process can be handled properly and that hidden agendas and blind spots should as far as possible be avoided. This is not an easy task for a person, therefore the facilitator should be a well-trained person who has a natural authority over the participants, has a lot of knowledge about the effects of different methods for knowledge acquisition, and has some general knowledge about the problem. If necessary he or she can be assisted by some specialists in the facilitation process in using specific methods for making knowledge models such as simulation models, scenarios or multiple criteria decision analyses (MCDA).

5. The Compram Methodology How Does It Work?

The Compram methodology is a methodology especially created for handling complex societal problems. The methodology was created by DeTombe in 1992 and developed further from that year on till now (DeTombe 1992a, 1992b, 1994, 2015, 2001a, 2001b). The ideas of the Compram methodology are based on literature from different scientific areas, such as Soft Systems Methodology (Checkland 1981, Forrester 1987, 1990, Newell & Simon 1972b, Hart 1991, Geyer & Zouwen 1986, VanDijkum 1992, Ackoff 1978). The combination of knowledge from these fields was the basis of the development of the Compram methodology and the field of Methodology of Societal Complexity and has been used for further developing the methodology and the field. The Compram methodology consist of six steps (see Figure 4). Each step is a group process of differently composed groups each separately guided by a facilitator. At the end of the sixth step the problem has been changed. This process can take a long time depending on the urgency and the complexity of the problem, mostly between three and twelve months. These six steps are not 'the seven steps to heaven'. Handling complex societal problems will always be difficult, never simple, and the outcome uncertain.

- | | |
|--------|--|
| step 1 | analysis, description and suggesting changes of the problem by a team of neutral content experts |
| step 2 | analysis and description of the problem by different teams of actors |
| step 3 | identification of interventions by experts and actors |
| step 4 | anticipation of the societal reactions |
| step 5 | implementation of the interventions |
| step 6 | evaluation of the changes |

Figure 4 The six steps of the Compram methodology (DeTombe 1994)

The Compram methodology can be used from the moment the problem owner decides to handle a complex societal problem, this is phase 1.4 of the first sub-cycle of the problem handling process (see Figure 3). The problem owner invites a facilitator to guide the problem handling process according to the Compram methodology. The facilitator starts by orienting to the subject of the problem, and by reading and interviewing several people who know something about this problem. Based on this orientation the facilitator writes a small report describing the current state of the problem, where it comes from, and who are involved. This report is then discussed with several experts on aspects of the problem and altered based on these discussions.

After this small description of the problem and the actors involved, the facilitator can invite neutral experts from the different knowledge fields related to the problem and experts who have knowledge about of the different actors groups that are involved. Each expert sees a part of the problem (see Figure 5), and, through the discussion, and the explanations of each other's knowledge about the problem, they gain a deeper insight into the problem. The experts should be neutral in the sense that they do not strive for a certain goal, or, a certain way of changing the problem. They should only share with the other experts the relevant knowledge that their field offers about the problem. Guided by the facilitator the experts share the knowledge they have about the problem with the other experts so that each expert can integrate the new knowledge with that of their own field. Together the experts try to answer questions about the problem such as what is known about

the problem, who is affected by it, which actors are involved, who benefits and who suffers, what emotions are going on, and what is the political vulnerability. After several meetings the multi-disciplinary group of experts has analyzed the problem and formulated the gained knowledge, which makes the conceptual model of the problem. The conceptual model of the problem is the definition of the problem. To support this discussion the experts are guided by the facilitator using the seven-layer communication model (see Figure 6) where the problem is described in several models, from natural words to a system dynamics simulation model. With the system dynamics simulation model the causal, linear and non-linear loops between the variables are indicated. The simulation model makes it easier to predict the effects of different possible interventions, which will be discussed in the second sub-cycle of the problem handling process.

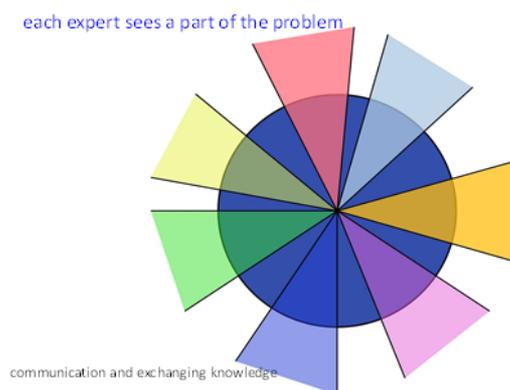


Figure 5 The experts' views (DeTombe 2001a)

6. The Seven-Layer Communication Model

Discussing and interpreting knowledge from

different fields with different experts is not easy. There are many pitfalls, therefore the Compram methodology provides a special tool, 'the seven-layer communication model' that supports the knowledge exchanges required in a multidisciplinary discussion (see Figure 6). The facilitator guides the information exchange using this tool. In the first layer the problem is described in words (natural language), in the second layer the concepts are defined, in the third layer the description of the problem is

analyzed to determine the quality of the knowledge. Is what the experts say based on theory, assumption or experience? The fourth layer develops a graphic model of the amount of knowledge that is known of the problem. Then based on the description of the problem in the first layer, a semantic model is developed in layer five. This is followed by a causal model in layer six, and a simulation model in the seventh and last layer. The content of the layers of the seven-layer communication model is:

- I Description in words (natural language) of the problem*
- II Definition of the concepts, phenomena and actors of the problem*
- III Verbal description of the basis of the knowledge: theories, hypotheses, experiences, intuition or assumptions, which explains the influence of the concepts, phenomena and actors on each other*
- IV Graphic representation of the knowledge in the knowledge islands*
- V A semantic model which is a graphic representation of the relations between the concepts, phenomena and actors*
- VI A causal model which is a graphic representation of the causal relations between the concepts, phenomena and actors*
- VII A system dynamic simulation model which is a graphic representation of the causal relations between the concepts, phenomena and actors based on differential equations.*

Expressing the problem in a seven-layer model makes it easier to see the relations of the phenomena and their effect on each other. Changes or alterations can be carefully described and simulated. The description of the seven-layer communication model in the problem handling process of sub-cycle one expresses the conceptual model of the problem, and thus the definition of the problem. Herewith ends the first sub-cycle of the problem handling process.

In the second sub-cycle of the problem handling process the changes of the problem

will be discussed. In this sub-cycle the conceptual model will be developed further into an empirical model by using the same filled seven layers as a starting point, and completing the description with more precise empirical data. This can be done supported by data miners. In this phase of the problem handling process, phase 2.1, also the desired goal of the problem handling process will be discussed. Keeping in their minds the benefit of all concerned, the experts can express what they would consider to be the desired goals of an intervention through which most 'people' would benefit.

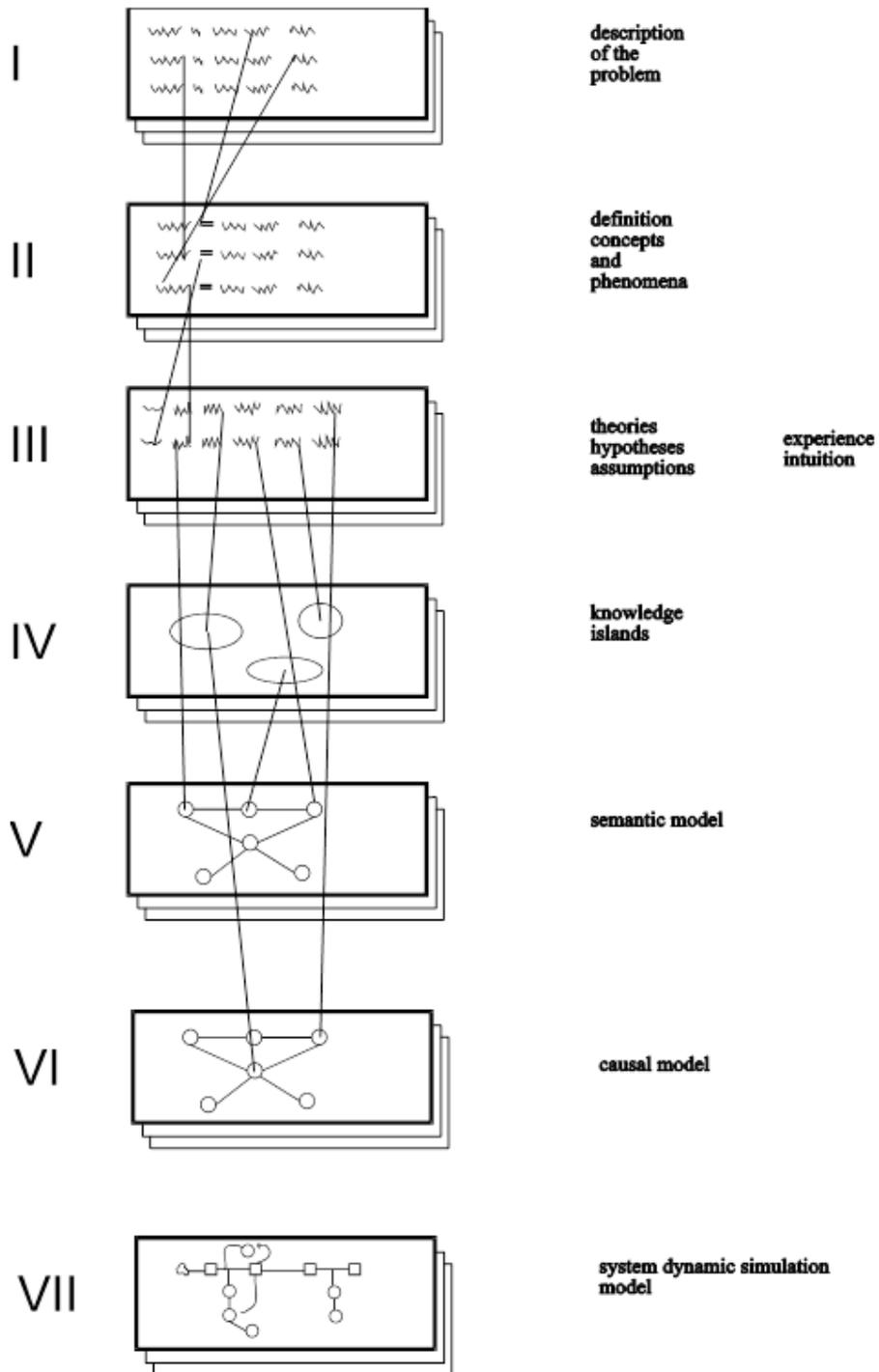


Figure 6 The seven-layer communication model (DeTombe 2015)

In phase 2.2 of the problem handling process the handling space will be discussed. The handling space is the space in which the problem can be changed. The level of the handling space is a concept that refers to the level on which the problem must be handled in order to get fruitful changes. The Compram methodology distinguishes four levels of handling space⁹. The first level of handling space is the level of the here and now within the existing situation and the ability of the present organizations to cope with it. In level two of the handling space the changes to the problem require more changes in the society, or the state. Perhaps some of some institutions should be merged or changed, and/or the roles of some of the professions within an organization need to be changed. Level three of the handling space requires major political or institutional changes, such as what happened after the revolution in 1917 in the USSR. The empowering of the laborers pushed the society from a feudal aristocratic system with the Tsar in charge to a communist system with laborers in charge. The fourth level of the handling space is an imaginary or fantasy level, which has no grounds in reality. These levels allow the problem handlers to expand the range of possibilities of changes to bring about desired goals. After discussing the nature of handling space according to the four different levels, the experts reflect whether the initial problem owner has sufficient power to implement all the changes.

As an example, consider the problem of water pollution in the river Rhine in the 70thies.

⁹ The handling space is described extensively in DeTombe (2015), chapter seven.

The river Rhine runs through different states of Europe and ends in The Netherlands into the sea.

When the handling space was limited to only the Dutch state, there was not much one could do to prevent the pollution, because the pollution mainly started in Suisse at the BASF plant which dropped the waste directly into the water of the river. When the problem owner was initially the Dutch state, the handling space was quite limited and there was little that could be done to improve the situation. Since the pollution of the river begins near its source in Basel, Switzerland, other problem owners of the European Union needed to be involved, if the situation was to be changed.

Then, in the problem handling phase 2.3 the group of experts can, based on scenarios, suggest several interventions and intervention strategies taking the desired goal and the level of handling space into account. Although some possible interventions are known which would be fruitful towards the desired goal, the interventions cannot be implemented right away. The experts do not have the power to implement the changes therefore actors are needed. This will be done in the second step of the Compram methodology.

The second step of the Compram methodology is inviting the actors involved. Although the important well-organized actor groups who are active and have much influence on the problem handling process should be consulted, it is also important to include the less active and unorganized actors who are influenced by the problem. In the case of a pollution problem the powerful actors are the private factories, plants, transportation companies and their workers. The less

powerful and less organized actors are the people living in the environment suffering from contaminated water and air. The actors who benefit from the problem and the actors that suffer from the problem must be identified. The facilitator invites each group of actors separately, and encourages them to perform the same process of problem handling described above using the same seven-layer communication model (problem handling phase 1.4 - 2.3, see Figure 2) in order to define their own views of the problem, their own desired goals, and to describe the interventions and intervention strategies they want. Each actor group has its own view of the problem slightly or totally different from that of the experts and the other actor groups. Each actor group has different power (see Figure 6). At the end of step two of the Compram methodology there are several completed seven-layer communication models.

In the third step of the Compram methodology the communication models of the actors and experts provide the bases of the mutual discussion between representatives of the actor groups and the representatives of the experts. The goal of this step in the problem handling process is to find mutual accepted interventions. The problem handling team, now consisting of actors and experts, should try to reach an agreement on certain elements of the problem definition, and on certain elements in the desired goals based on the comparison of the seven-layer communication models. Then it could be possible to find some mutual acceptable interventions that can be implemented. Describing the problem in the seven-layer communication models by the experts and the actors groups makes it easier to

see where the agreements and where the differences are in the view of the definition of the problem, the desired goals and interventions, while the seventh layer, the simulation model, can be used to experience what the effect of certain interventions can be.

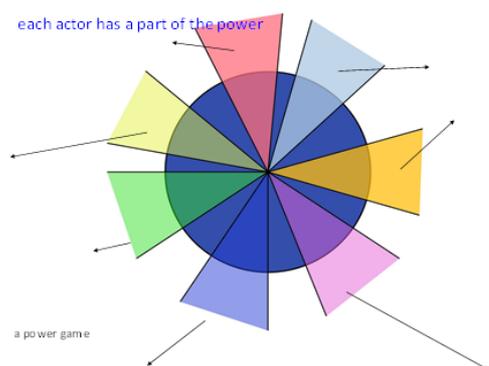


Figure 7 The actors' power (DeTombe 2015)

When the handling team agrees on certain interventions, it is time to break the problem handling process open. Although the problem handling process is done with the support of many people it is not performed with the whole society. In a democracy, not only the involved actors have to be consulted, but also the general public. Before implementing the interventions the society as such should be informed about the interventions and, if possible, should agree on them. This is step four of the Compram methodology where the results of the discussion in step three are communicated with the people and in which the people can, in organized discussions, give their opinion towards the plans. Based on these discussions some alterations can be made in the plans. These changes should then be discussed with the experts of step one and the actors of step two in view of the effects of the

alterations towards the original plans.

When there is finally an agreement, the interventions should be carefully implemented guided by the facilitator and the experts. This is step five of the Compram methodology. Meanwhile the panel of experts and the facilitator should be aware that the problem and the society have changed during the problem handling process, and take this into account. Implementing changes can take a short or a long time, depending on the kind of changes needed for changing the problem towards the desired goal.

Directly after the agreement on the interventions, and after starting the implementations of the proposed changes, the problem and the problem handling process itself can be evaluated. This is step six of the Compram methodology. The evaluation of the problem can be done based on the reports that the facilitator made after each step. Is the problem changed into the desired direction? Which parts should be considered again? What is changed in the meantime in society and are the interventions still valid? Based on these discussions with experts some elements of the problem can be improved in the future. Then, sometimes years later, the changes of the problem can be again evaluated from the perspective of the problem situation at the time of its beginning, during its progress, and then at the contemporary situation of the problem in the now changed society. Often then the problem should be considered again and the problem handling process should start all over again.

At the same time of the start of the evaluation of the problem the group process can be evaluated. Questions such as what went well?

What went wrong? What could have been done better? Which mistakes were made? Which things were missed? Was the focus too narrow? Were there many blind spots? Were the white spots filled? Was there groupthink? Were there personal conflicts, hidden agendas, and/or jealousy? Based on these discussions with the actor groups and experts groups some elements of the problem handling process can be improved in the future.

The Compram methodology is a framework methodology, this means that based on the moment in the problem handling process specific methods and tools can be used, such as discussion support tools like the software used in the group discussions room, scenarios methods and voting methods (DeTombe 1999). Handling a complex societal problem in the way that the Compram methodology prescribes provides the opportunity to get a deeper insight in the problem, by including the knowledge of different fields, and by including the power and knowledge of the main actor groups. Discussing the results of the discussion with the people is a basic demand in a democracy. The Compram methodology combines aspects of different approaches into a structured interactive approach for policy making in collaboration with experts and actors in order to find possible transitions of the situation that can be mutually accepted and implemented into real life.

7. Knowledge Institutes for Global Safety

In 2006 the OECD¹⁰ recommended use of the Compram methodology (OECD 2006) to

¹⁰ OECD is the Organization for Economic Co-operation and Development erected in 1960.

handle global safety¹¹. Many complex societal problems are a threat to the life of the people, the economy and the stability of the state, but most of all to the quality of life. In order to create a safer society one needs to know from where the dangers come and what causes the threats. Each threat has different causes and different effects on different elements in society. Therefore one has to carefully analyze the situation, and make a distinction between causes and effects. It is important to determine what the elements of each threat are, and how they are related. It is also necessary to determine which power groups are involved and to find out which package of sustainable changes can have the desired effects. Although many complex problems greatly differ, they can all be analyzed and handled fruitfully with the Compram methodology.

Handling complex societal problems, that are the task of politicians, needs a special approach. However, most politicians are neither well educated, nor well prepared to handle these complex societal problems adequately and optimally. Therefore the OECD (2006) advised each country to create Knowledge Institutes that would prepare teams of people to be ready to react, as needed, on old and new complex societal problems based on the ideas of the Compram methodology. In Japan a Knowledge Institute named JST-RISTEX was created in 2002 based on the Compram methodology. This institute is connected to and works closely

together with the University of Tokyo.

The Knowledge Institutes can advise policy makers on how to handle global safety issues in an integrated multi-disciplinary, and multi actor approach. These institutes can focus on specific local complex societal problems in cooperation with the already existing local institutes on safety. Internationally they can cooperate with same kind of institutes on global threats. The Knowledge Institutes should be closely connected to the university. At the university, departments for the field of Methodology of Societal Complexity should be established where students from all sciences can experience how to handle complex societal problems.

8. Conclusions

Complex societal problems are serious multidisciplinary and often ill-defined problems with extensive impacts on all levels of society. These problems are compounded by the number of different actors or groups of actors involved in the problem. In addition these problems provoke intense emotional responses to the various power structures that intersect. Consequently, handling complex societal problems in a proper way is complex and difficult, due to the many interactions and the unpredictable non-linear feedback loops. The future developments of the complex problems are hard to predict. Handling complex societal problems will never be easy.

The politicians should follow the advice of the OECD (2006) to guide complex societal problems using the prescriptions of the field of Methodology of Societal Complexity and the Compram methodology to handle complex societal problems. The universities should

¹¹ Research Institute for Science and Technology for Society, Japan Science and Technology Agency see Report on the Workshop on Science and Technology for a Safer Society 20-Jul-2006 <http://www.oecd.org/dataoecd/29/2/37163745.pdf>.

include the knowledge of the field of Methodology of Societal Complexity into many disciplines so that future managers working in different areas are aware how complex societal problems should be handled.

The Compram methodology is a prescriptive framework method in which all kind of sub-methods can be applied. The Compram methodology has been used as a theoretical basis for handling over sixty real life cases of the government and of large organizations and in used for handling many real life complex societal problems on many subjects all over the world

In the book *Handling Societal Complexity* (DeTombe 2015) several examples are worked out of the use of the Compram methodology applied on different fields such as healthcare, credit crisis, climate change and terrorism¹².

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