# Method MMP

Method MMP is the method of modelling with «micro people» or method «Modeling with Micro People».

**Task N.6.12.**[*)] Many foods must be stored at low temperature in order to be preserved. If the food is stored for a long time, then the owner must have a way of finding out that the temperature has not increases (and the food didn't go bad).

How can this be accomplished? The use of regular thermometers in this case is insufficient.

When applying the method MMP the most important part are the actions taken by the person solving the problem, and the less important part are the problem conditions and properties of the system which must be changed. Hence, the method MMP is an organizational instrument.

This instrument is a must in ARIZ (step 4.1). On the other hand, in order to get the best results with method MMP, one has to first analyze the problem with the first three parts of ARIZ. This analysis brings forwards the technical contradictions of the problem, conflicting pair (item and instrument), the actions of the Eks-element, operational zone and operational time, ideal final result and physical contradictions in the problem. Now, to eliminate the physical contradiction from the operational zone, one has to transform components of the system. This is best achieved with the method MMP.[**)]

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[*)] *Tasks of N series are taken from the separate collection prepared by authors.*

[**)] *The explanatory of some terms look in section* ***25*** *«**Terms which are used in TRIZ».***

In the task **N.6.12** this can be viewed the following way:

There exists a conditional «thermal field»*), temperature, which can change. It is necessary to know for certain whether the temperature went up or not (above a certain threshold). This can be determined with some sort of instrument (a regular thermometer may be unreliable). Therefore, wherever the «thermal field» is active (and where the food must be preserved) some sort of particles must be present (parts of the instrument or the Eks-element). These are the particles that will be the micro people.

This problem requires the micro people to react to the change in temperature. This reaction may be expressed only through interactions and displacement of the «micro people» because these are the only things that can be shown in a drawing.

There must be at least two drawings: the state at the allowed (low) temperature and the state at the not allowed (high) temperature.

**Before**
**(low temperature)**

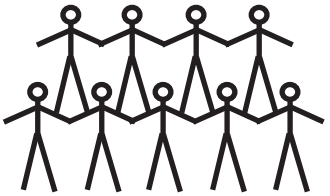
**After**
**(high temperature)**

When the temperature rises, the «micro people» stop holding hands and even step away from each other. This is easy to notice and can have both physical and technical correspondence.

However, there is a problem: after some time the temperature may drop again and «micro people» will start holding hands again. How can one know if they ever stopped holding hands?

*) *The modern physics considers four fundamental fields. But for the description of technical systems is allowable to use many other conditional «fields». These quasi-fields which can be the most different by the nature, do the description of systems by more simple, and the solution of tasks easier. Certainly, thus it is necessary to remember always, that these «fields» are conditional.*

Evidently, when the «micro people» let go something irreversible must happen. It is very important that this is expressed only through the actions of the «micro people».



**Before**
**(low temperature only)**

**After**
**(after high temperature)**

At the low temperature, «micro people» pile up into two layers (two storeys). At each level they are holding hands and so the top layer is standing at the bottom one and does not fall through.

Yet, as soon as the temperature goes up (exceeds the threshold) they let go of the hands and the «micro people» of the top layer fall through to the bottom level

Now if the temperature does decrease again (below the threshold) «micro people» will not be able to form two layers, although they will be holding hands. Such a change in the number of levels («storeys») would be a sign that at some point in time the temperature increased and the food may have gone bad.

The easiest technical solution is to use the available ***resources***, a substance that is already present in the system and can perform the desired task. In the fridge, such a substance may be ice.

If there are pieces of ice piled up into two layers or a little pyramid. Then after the sudden defrosting (undesired temperature rise) there will be only one layer of ice left and it will be instantly noticed.

More rigid rules of using the method MMP are described in ARIZ as follows:

*a) build the schematic of the conflict using the method MMP;*

*b) modify the scheme so that the «micro-people» acted without causing a conflict;*

*c) move on to the technical scheme.*

***Remark:***

*31. The essence of modeling with «micro people» method (method MMP) is schematically presenting the conflicting demands in form of a drawing (or a number of consecutive drawings) of a large number of interacting «micro people» (a group, a few groups, «horde»). The «micro people» should represent only the changing parts of the problem model (instrument or Eks-element).*

*«Conflicting demands» is a conflict arising from the model of the problem or opposite physical states, specified in step 3.5. It is possible that the latter is preferred, since it would be easier to illustrate the «conflict» in the model of the task, but there are no solid rules governing the transfer from the physical problem (3.5) to MMP.*

*Step 4.1b can be done by putting two illustrations on the same drawing: the bad action and the good action. If events develop with time, then one should consider having a few consecutive pictures.*

***Attention!***

*It is easy to make a common mistake by limiting the drawing to quick and rough sketches. A good drawing should be:*

*a) Self-explanatory and easily understood without word;*

*b) Provide additional information about the physical contradiction and point to possible ways of eliminating it.*

*32. Step 4.1 is secondary. It is needed to give a better understanding of what the particles must do in and around the operational zone before VPR mobilization. The method MMP helps to see the ideal action*

*(«what needs to be done») without the physics («how to do it»). This removes the psychological inertia and focuses on the creative work. Hence, MMP is a psychological method. Nevertheless, because the modeling with «micro people» accounts for laws of system development, it often leads to a technical problem solution. In this case the solution shouldn't be interrupted and the mobilization of VPR (vepol resources or object-field resources) must be carried through*

This is the step 4.1 in ARIZ-85V.

An earlier version ARIZ-82 also used the method MMP (in step 3.5), but back then it was not detailed enough and its use was less accurate. For the first time, the «micro people» appeared in 1977 in the book «***Inspiration by Order***»[*)] (by A.B.Selutskij and G.I.Slugin). G.S.Altshuller wrote the chapter on the course «Development of Creative Imagination» for this book.

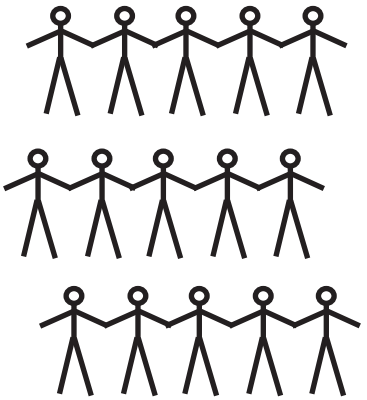
A direct and immediate application of the method MMP helps to solve more that simple problems.

**Task N.6.11.** Typical lubricant «freezes» when temperature is lowered: its viscosity increase and the lubricating properties decrease.
How can one make the lubricant resistant to the temperature drop?

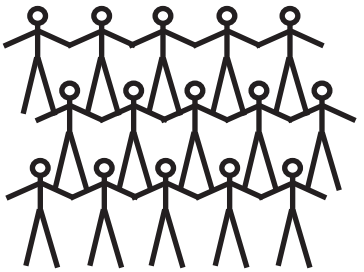
Certainly, at absolute zero any lubricant would freeze (except for greasing from helium), but in practice such low temperatures rarely occur. Sometimes a change in temperature as little as 10 degrees may be very important. And the help of the «micro people» is important here as well.

Let's carefully look at the «Before» and «After» pictures. At high temperatures the layers of the lubricant can easily move (slide); they don't interfere with each other, although in the layer itself they firmly hold hands. This is the «Before» picture. At low temperatures (the «After» picture) the interactions between «micro people» is increased and the layers start to cause interference, prevent motion, and cling together.

*) *More in detail about TRIZ books look in section* **22** ***«Literature»***..



**Before**
**(high temperature)**

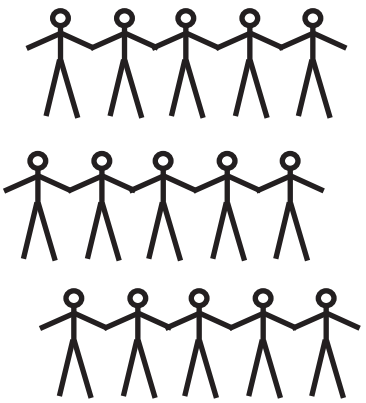


**After**
**(low temperature)**

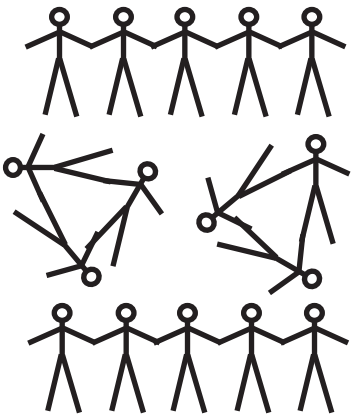
The «micro people» need help. Of course when the temperature is lower they hold on to each other more firmly, but this interaction can be controlled. Let the «micro people» hold hands tighter, but this connection shouldn't prevent the sliding of separate layers.

The result is a rather unusual middle layer: «micro people» are sturdily bound together, but their connection forms rings. Note that the size of a ring may be greater than three. Not only can these rings slide along the adjacent layers, but they can also roll along them. Friction is significantly reduce, which in turn reduces the overall viscosity of the lubricant.

Here, a new problem arises: How can one force the «micro people» into forming rings? Typically they only do whatever is convenient and does not require extra effort. Hence, a new substance must be introduced into the lubricant to «bring order» among the horde of already present particles. That is, this new addition should easily form an ordered structure or already posses such a structure, while still following the ***laws of system development*** and rules for ***Vepol model*** construction.



**Before**
**(high temperature)**



**After**
**(low temperature)**

It is not hard to find a whole group of such substances in the ***System of effects*** used by TRIZ. They are aromatic carbon compounds, which are known for their benzene rings. Although this connection may seem crude, benzene rings do play a role of a peculiar roller-bearing at molecular levels, which reduces the friction among separate layers of the viscous liquid.

Thus, the solution of this problem requires the use of aromatic compounds, like methylcyclohexane or toluene…And use of «micro people».