

Fantogramma: a Technique for Generation of New Fantasy Ideas and Training Creative Imagination

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INTRODUCTION

“Fantogramma” is a powerful thinking tool for producing new science-fiction and fantasy ideas in a systematic way. The idea of Fantogramma was originally proposed by the author of TRIZ Genrich Altshuller in 1971 as one of the techniques designed for developing and improving personal creative skills, and later became a part of Creative Imagination Development courses within TRIZ community.

To search for creative solutions to problems, it is very important to relax constraints, withdraw from accumulated personal experience, get rid of mental associations, and free our mind from known concepts as much as possible. Working with Fantogramma improves our ability to think “out of the box”, helps migrating between different system levels to imagine new creative ideas and develops skills to recognize hidden possibilities.

Fantogramma might be found useful by science-fiction and fantasy authors, futurists, movie directors, creative advertisers, and anyone interested in producing really new fantastic ideas. But I would like to stress that its primary function is to provide a platform for further development of our creative imagination which can be used by anyone who is willing to expand his or her horizons of creative thinking when inventing new concepts and ideas.

PROCESS WITH FANTOGRAMMA

A process of using Fantogramma consists of 5 steps:

- a) Select an object on the basis of which you want to obtain a new fantastic idea and define a set of specific features of the object selected (so-called “specific indicators” in Fantogramma).
- b) Change any specific indicator of the object selected according the so-called “Methods of Changing Indicators”.
- c) Imagine how the object will change and what it can become. “Invent” a new object by using your imagination. At this step, you can try several combinations “specific indicator – Method of Changing Indicators” and generate a number of ideas.
- d) Select one of the ideas produced at the previous step.

- e) Imagine how all other indicators (specific features) will change according to the idea of the changed object. Generate new ideas.

Basically, Fantogramma is represented as a two-dimensional morphological matrix, in which the indicators are listed along the vertical axis, and methods for changing of the indicators are listed along the horizontal axis. Cells in the matrix can be used to record new ideas.

Universal Indicators	Specific Indicators	A	B	C	D	E	F	G	I	H	J	K
1U	1S											
2U	2S											
3U	3S											
4U	4S											
5U	5S											
6U	6S											
7U	7S											
8U	8S											
9U	9S											
10U	10S											
11U	11S											

Universal indicators are the most important indicators, which describe any large group of objects:

1. Matter (substance), which comprises an object (chemical composition, phase state).
2. Subsystem (components an object consists of).
3. Type of an object, name of an object.
4. Supersystem (a system of a higher level where the object belongs to, environment).
5. Direction of evolution.
6. Method of reproduction (or production).
7. Type of energy consumption.
8. Method of transportation.
9. Area of distribution.
10. Level of organization and control.
11. Goal (purpose).

These universal indicators will be exactly the same for every object, while specific indicators are defined every time for each selected specific object.

Methods of Changing Indicators:

A	Increase – decrease
B	Merge – separate (segment)
C	“The other way round”: replace a given feature (property) with a feature that has an opposite feature property (anti-feature).
D	Accelerate – slow down.
E	Shift in time forward – Shift in time backward.
F	Change relations between an object’s property and time, or an object’s structure and time.
G	Separate a feature or a function of an object and transfer it to another component of a system or supersystem. Alternatively, bring in a property (function) to an object which is a property of its environment (supersystem)
H	Change a way in which an object is linked to its environment, or change environment
I	Change quantity featuring an indicator.
J	Make a static property dynamically change, a dynamic property – static.
K	Make artificial alive – make alive artificial

Readers familiar with TRIZ will quickly recognize that these heuristic methods are similar to the famous TRIZ Inventive Principles. And similarly to a discovery of Inventive Principles, these methods were identified by a large study of science-fiction literature undertaken by G. Altshuller and his associates.

USING FANTOGRAMMA: CASE STUDY

Let us study an example: suppose, we want to “invent” a new fantastic animal. Our basic object will be a multi-cell biological organism, let’s take for example a cat.

Step 1. Define a set of specific indicators for a selected object.

Universal Indicator (U)	Specific Indicator (S)
1S. <i>Matter:</i>	Proteins, colloidal solutions
2S. <i>Subsystem:</i>	Biological cells
3S. <i>Object:</i>	A cat (Multi-cell biological organism)
4S. <i>Supersystem:</i>	Herds, prides, etc.
5S. <i>Direction of evolution:</i>	From a single cell towards an organism

6S. <i>Method of reproduction:</i>	Self-reproduction
7S. <i>Type of energy consumption:</i>	Oxidation of food
8S. <i>Method of transportation:</i>	Walking, running, swimming, jumping
9S. <i>Area of distribution:</i>	Soil surface, forests, deserts
10S. <i>Level of organization and control:</i>	Self-intelligence
11S. <i>Goal:</i>	Participation in the biological evolution (food chain)

Step 2. Select any combination of any specific indicator and any Method of Changing Indicators. For instance, take the combination “3S and A”. (There are no rules defining which combination to select, so any can be taken).

In our case, a cat (chosen as an object, 3S) has to vary its sizes.

Step 3. Study how a selected specific indicator will change. It is very important to not limit a scale of possible changes. We invent a fantastic animal! Try to imagine, how an object and its environment will change and what they will become?

We can imagine a cat which is of size of a molecule. It does not matter that this contradict laws of physics – again, we are inventing a fantastic animal. Or imagine a cat of size of a house, or a continent, or even an ocean (such examples are known in science fiction, for instance, “Solaris” by S. Lem: a whole ocean is a single living organism, or an animal of a size of a planet (Conan Doyle’s “When the Earth cried”).

Step 4. Select one of the ideas generated at the previous step.

For instance, we want to continue with a mountain-sized cat.

Step 5. Study what changes indicators 1U-11U will experience (except already selected indicator). How to feed the mountain-sized cat? How does it reproduce? How does it move? To improve the idea generation process, it is advised to use the Methods of Changing Indicators.

For instance, we want to invent a new idea how to feed a mountain-sized cat. Let us use the Method of Changing Indicators #G: “To separate a feature (or function) from an object”. Therefore, the feeding process is not organized by our huge cat, but, for instance, by an atmosphere in which the cat lives. For instance, our cat does not need water since it can “drink” clouds. Or, our cat does not feed itself at all – there are other smaller animals (e.g. tiny dogs) which live in the fur (like in a forest) of our cat and bring food to him. Thus our mountain-cat develops symbiosis with dogs... And so forth.

Consider changing of another indicator: how our cat will evolve? Let us take a combination of 5U and G. Can evolution be separated from an animal? Why not? Let us imagine that our cat becomes super intelligent and wants to colonize a newly discovered

planet, but the conditions on the planet are not very comfortable. Therefore, the cat produces a number of models (copies, clones) of itself with different characteristics and sends them on a new planet. The fittest will survive while our original cat can enjoy safety of its home planet.

CASE STUDY 2: PHONE

Fantogramma can be applied to any type of objects – alive and artificial, material and immaterial. Let’s apply the same approach to invent a new object on the basis of a traditional telephone.

Step 1. Define a set of specific indicators for a selected object.

Specific indicator	Value
1S. <i>Matter:</i>	Plastics, metals
2S. <i>Subsystem:</i>	Electronic components
3S. <i>Object:</i>	Telephone (Artificial device)
4S. <i>Supersystem:</i>	Phone network
5S. <i>Direction of evolution:</i>	From wired to wireless, from large to small
6S. <i>Method of reproduction:</i>	Manufactured
7S. <i>Type of energy consumption:</i>	Electrical energy
8S. <i>Method of transportation:</i>	Carried out by someone else
9S. <i>Area of distribution:</i>	Office, home, street, city
10S. <i>Level of organization and control:</i>	Electronic, human-controlled
11S. <i>Goal:</i>	Transmit voice over a long distance

Step 2. To select a combination of any specific indicator and any Method for Changing Indicators. For instance, take the combination “4S and I”.

In our case, the phone network has to vary from a single phone to billions of phones.

Step 3. Analyze how a selected specific indicator will change. Imagine, how an object and its environment will change and what they will become?

The phone network has to vary from a single phone to billions (zillions!) of phones. We can imagine now, that the phones in a huge network would become very-very small, even of molecular size, so you can have your own phones installed everywhere wherever you want, so you do not have to carry one.

Step 4. Select one of the ideas defined at a previous step.

A phone network of billions of micro-sized phones.

Step 5. Imagine, how will change indicators 1U-11U for a selected idea (except the indicator selected at Step 2).

1. Substance which comprises an object (chemical composition, phase state): molecule.
2. Subsystem: atoms acting as electronic components.
3. Object: a phone which is a single molecule.
4. Supersystem: phone-molecules wirelessly connected.
5. Direction of evolution: to acquire new functions.
6. Method of reproduction: molecular synthesis (nano-assembly?).
7. Type of energy consumption: radio-waves.
8. Method of transportation: not necessary to carry: a phone built-in in to your clothes, pen, etc.
9. Area of distribution: everywhere.
10. Level of organization and control: Artificial Intelligence.
11. Goal: provide "smart" wireless voice communication.

Thus as one can see, we can play not only with fantastic modifications of a selected object, but create a whole new world around it.

FEATURES TRANSFER IN FANTOGRAMMA

There is another approach to working with Fantogramma: by transferring features of one object to another object, and using the methods of changing indicators to generate new sets of ideas around an invented idea.

Step 1. Select two different objects. Define specific indicators for both objects. Then take any value of an indicator, which belongs to the first object, and replace the corresponding value of the second object with the first value.

Let's take a specific indicator #7: a method of reproduction. Telephone is manufactured, while a cat is self-reproducible. What will happen if the phone becomes self-reproducible?

Step 2. Follow all changes of the modified object according to 1U-11U indicators. To intensify ideas, use methods for changing indicators:

What will be an object in case of a self-reproducible phone? Will it be biological phone? Now imagine phones which can combine to herds, prides... Or become organic parts of human beings. And so forth.

CONCLUSIONS

As can be seen, Fantogramma can be used to invent new fantastic objects with new properties and features that we have never thought about before and build new ideas around these objects. Fantogramma is not limited to inventing a single idea. By using Methods of Changing Indicators we can create a whole spectrum of ideas and even entire new fantastic worlds. And this process might not be necessarily limited to creating science-fiction or fantasy ideas. The technique can be used to create ideas of new products, creative advertisements, and so forth... But its main power is in practicing and developing our creative imagination. The technique is universal and can be practiced by kids and adults.

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Valeri Souchkov has been fully involved with TRIZ, Systematic Innovation and Creative Imagination Development since his graduation in computer science and engineering in 1988. He launched first regular TRIZ courses in Western Europe in 1993, and in 2000, he initiated and co-founded the European TRIZ Association ETRIA. He is also active TRIZ developer and author of several new TRIZ techniques. Currently he heads ICG Training & Consulting which focuses on professional TRIZ training and consulting, and also teaches a full-length TRIZ course to B.Sc and M.Sc students at the University of Twente in the Netherlands. He can be reached at valeri@xtriz.com