Metaphor - a Working Concept

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METAPHOR - A WORKING CONCEPT

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Abstract

The purpose of this study is to examine and present an overview of the spectrum of non-literal expressions, metaphors and tropes in order to develop the terminology and make way for a more extensive use of metaphor in product- and system development and design.

The developed world is rapidly moving into the post-industrial information age, facing the society with a new set of problems that cannot be solved using only the methods developed in the industrial context.

Computer- and information systems of high complexity, software and immaterial products like services and concepts but also new advanced technology like electronics are examples of phenomena that have to be explained through terms from other domains.

A metaphor is an expression with two conceptual domains - where one is understood in terms of the other. Metaphors were previously seen as rethoric tools but today metaphors have been proven to be firmly linked to our way of thinking. Everytime we experience a new phenomenon we try to understand it in relation to our previous experiences and to similar phenomena - in a similar way metaphor uses similarities and differences.

Metaphors, and other kinds of symbolic and non-literal expressions, are being used in many fields to make abstract and complex phenomena comprehensible and tangible. User interfaces for computers, for example, often use a basic metaphor, but metaphors are also used to explain insurances, banking and telecommunications services and so on. In politics, management consulting and advertising the metaphor is often used for its powerful and sententious properties, and for its ability to create strong visions and concepts.

The less "self-explaining" a product (or a concept) is, the more complex and abstract the message, the better suited is the use of metaphor.

Olle Torgny

Introduction

The developed world is today going through a transition from the industrial society to the post-modern information society. A rapid development in the field of information technology and telecommunications is gradually changing the conditions for work and everyday life for vast groups.

The modernistic, industrial philosophy which has formed the western world is being questioned in many senses. Our common experience shows us that our material culture does not only bring good things - neither for our way of living, our working conditions or the environment. (von Wright, 1982)

Searching for the basic truths, science has reached a crisis where the world no longer can be properly explained through analysis of its most basic elements. Einsteins relativity theory is only one example.

Meanwhile, the new information technology offers an enormous potential, but apparently it cannot be dealt with using only the methods and values developed in the industrial context. For example, unlike a mechanic construction, the function of a piece of electronic equipment cannot be understood by studying its basic structure. (Kristensson Uggla, 1994)

The well known painting by René Magritte, with the smoking pipe and the text "Ceci n'est pas une pipe" (This is not a pipe) shows us the difference between the representation and its object.

In cases, in the post-modern context there is no "real pipe", many of the "real objects" can only be understood through their representations.

The computer industry has realised that computers and information systems cannot rely on technical performance only. The systems' ability to communicate with the user is a crucial factor where the perceptions, attitudes and the mental model of the user are vital components.

The "mechanism" of these kinds of products is partly generated in the mind of the user, not only within the product itself. The high degree of subjectivity, as well as the dependence the different concealed potential of different users means that there is no objective "truth" within the system - or product - itself to be presented sincerely and clearly. For example the different actions and processes carried out by a computer or simply a calculator are in themselves incomprehensible for anyone but the electronic engineers - the concept of what is actually happening has to be conveyed by something else (Salmon and Slater 1987). There are also cases where the functionality and the presentation both are immaterial, for example service products and information services. Simple descriptions and symbols will not be sufficient in this communication process between the user and the system.

In some of these cases the representation even creates the actual product. In all these contexts, the use of metaphors have become more and more important. (Thackara, 1996)

In the agricultural society, the basic metaphor was THE BODY - all things where seen from a holistic viewpoint, where the whole was dependent of each part and only could be explained from an exterior view.

In the industrial society, the basic metaphor was THE MACHINE - where the whole can be understood by analyzing the parts. Just like parts in a machine, workers in the factories could easily be replaced if not productive enough.

In the post-modern society the basic metaphor is actually THE METAPHOR - most phenomena must be explained and analyzed through something else, the basic structures are paradoxal and irrational. (Kristensson Uggla, 1994)

Today metaphors are used in many different fields: to explain computer systems, to describe organisational phenomena, to summarise complex ideologies in politics, as a

tool to make services tangible. The word metaphor and its concept, is used in many different ways, in different contexts and for different reasons.

The purpose of this study is to investigate the existing terminology of metaphor, to compare this with the current use of the word, and to discuss the potential of metaphors.

So, what is a metaphor? The most general description is that metaphor is an expression with two conceptual domains (knowledge fields) - where one is understood in terms of the other. (Gibbs 1979) The two concepts are referred to as "source" and "target", where the source is the domain where the actual statement is generated, and target is the domain that will be used to explain the statement. Often, the two domains even help to explain each other. (Fauconnier, 1996)

There have been several different theories about metaphors and their use, where metaphors have been described as something to be used for rhetorical purposes, as a decoration of language, as a way to create mental model (Black 1979) or even as the basis of all human thinking (Lakoff and Johnson 1980).

Metaphors and Tropes - Classic Rhetorical Tools

The first theory that we know on metaphors was presented by Aristotle, who saw metaphor as a rhetorical phenomenon. By using one concept, or word, to indicate another one a discourse could be made in a more exiting and elegant way. The metaphor was seen as a rhetorical effect to be used instead of saying something straightforward. Aristotle compared metaphor with simile (which is a more concrete and explicit comparison between two concepts) and found that the metaphor was shorter and more concentrated than simile, using surprise and "concealedness" to make a statement more interesting. (Backman 1991)

This theory is called the substitution theory (Tepper, 1993), and is based on the concept of transfer of meaning - metaphor is used to change the meaning of a word, for example, metaphorically speaking, in order to dress a less pleasant word in a nicer costume.

Metaphor and Cognition

On the semantic level of language words and expressions are combined in a process where the relation between the words, and the relation to the phenomena they are referring to, meaning is created in a way that has been described by semiologists like de Saussure (1915).

Important factors are the background experiences of the user, or the reader. When we perceive something - a person, an object, a system and so on - we put this in relation to the context and to our own experiences. If the phenomenon is all new to us, we try to understand it in terms of the things we already know - within the same domain or context, colours, sounds and other properties. This process can be both conscious and unconscious. (Edfeldt 1992)

The context is also important (af Trampe 1989) and one certain expression can mean different things in different contexts. As an example John Fiske (1982) uses the traffic signals, whose red light means something completely different in the traffic context than in the "red light district" context.

According to Backman, referring to Frege (Black and Geach 1952) and W.V. Quine, there are three major factors influencing the meaning of an expression:

• The convention, which is a product of the history of a language

• The personal experience of both the language and the world

• The context in which we place or find the expression (Backman 1991)

Modern research on metaphors has shown that metaphor is not only a superficial, rhetorical instrument, but firmly linked to our way of thinking and understanding the world. (Ortony 1979)

A new way of looking at metaphors has emerged as a result of research by IA Richards, Max Black, later Lakoff and Johnson and others.

What they all have in common is the idea that our way of understanding the world is basically metaphorical.

Mapping

The process of applying our experiences on things that are new to us is called "mapping". Gilles Fauconnier (1992, 1996) has identified a number of different kinds of mappings that we use to solve logical problems but also to understand phenomena that are new to us.

Analogy is the most obvious kind of mapping, for example a finger is related to the hand like the toe is related to the foot - what we know about the properties of one thing helps us to understand the other. The most complex kind of mapping according to Fauconnier is the metaphor, where the two structures - or concepts - being compared actually explains each other.

For example, the metaphor "You are digging Your own grave" consists of a source that says "failure" and a target that says "death". In this metaphor the target domain is not evident as people do not die as a direct result of having dug a grave, so here the "failure" domain explains the "death" domain, the source explains the target.

Basic and Image Metaphors

George Lakoff (1987) has identified two kinds of metaphors: basic metaphors and image metaphors, where the basic metaphors form basic concepts from which a number of image metaphors can be generated. For example, a basic metaphor like "ARGUMENT IS WAR" can generate image metaphors like "Defend Your idea". Basic metaphors are in the metaphor literature written with capital letters.

Metaphors and Transfer of Meaning

In the case of the "Substitution Theory", a concept from one domain takes the place of a concept from another domain - a transfer of meaning takes place. The modern theory for metaphors, the "Interaction Theory" emphasises the interaction between the two domains, the two concepts. (Tepper 1993) Note that in the case of metaphor the two domains do not have to be presented in words - it is possible to say "He is a house" or "The 'house' is coming for dinner". This can be compared with a simile like "he is big as a house" where only explicit, size-related associations are activated.

The interaction between the two concepts produces the metaphorical components of surprise and "profoundness" - a large number of links to different experiences are activated, while in the case of metonyms for example, the cognitive process is much more simple. (Ricoeur, 1977)

The transfer of meaning is one of the most accepted criteria of a metaphor, but even this has been questioned by for example Searle (1979), who means that as long as the interaction between the two domains work, the meaning of each one of them is still intact.

One could even say that real metaphors always create new meaning and a more profound understanding of the actual phenomenon, using the tension between the two domains. (Kristensson Uggla 1994) This can be compared with so called "Dead Metaphors", metaphors which have become words or concepts like any other. In this case the meaning

of the word, or concept, has changed so in this case an actual transfer of meaning has taken place.

The Power of Metaphor

Metaphors have a way of activating previous experiences and associations. (Black 1979) At a first glance they can seem ambiguous and paradoxical, but in practice they can explain complex concepts both quicker and more accurate than a more literal explanation. In many areas, especially where instant communication of complex messages must be achieved, metaphors have become more and more important.

The time available for politicians to make statements in television news programs and other media has gradually shrunk, making it vital to be as sententious as possible. In this situation the use of metaphors can help to convey more information in less time. The use of metaphors in politics is not new, just think of Sir Winston Churchill's classical metaphors.

Management consultants, and corporate CEOs also use metaphors to explain complex reorganisations, introduce new values and plant corporate cultures, often affecting the business concepts and in the end the products offered. (Morgan 1983)

Barbara Czarniawska-Joerges (1988) has defined three categories of expressions used by especially management consultants:

- label - a literal definition, related by convention
- metaphor - in this context the power and the exiting dimensions are important
- platitude - over-used, dead metaphors, that have lost their metaphorical meaning.

According to Czarniawska-Joerges the work of management consultants is characterised by deliberately high costs (the investment makes the client take recommendations of the consultant more seriously), the freedom of moving around in the organisation talking to employees at all levels and finally - the use of metaphors. In this context metaphors help to create sententious concepts and visions that conclude all the ambitions of the company, which everyone in the organisation can understand.

A more amusing example of how powerful metaphors can be is the Italian movie "Il Postino" from 1995, where a young man's contact with a poet, and the introduction of metaphors, changes both himself and his environment. One of the memorable lines is the angry mother of the girl he loves who shouts: "You have seduced my daughter with Your metaphors! Go away!"

Metaphors in Product Development and Design

In marketing, and product development, metaphors help to explain the properties of a new product in familiar terms. New products often start out as metamorphoses, as a mix of something previously existing and some kind of new technology or application. For example the early automobiles looked just like a horse-wagon, just without the horse. References to familiar concepts often help to make new products accepted on the market.

The Swedish insurance company "Trygg Hansa" has used a "Department Store" metaphor to convey the message that getting an insurance or any other service at "Trygg Hansa" is - in contrast to other insurance companies - just as simple as shopping.

Another example of this is the very successful introduction of computer spreadsheet programs, with a clear reference to the physical spreadsheets in printed paper that existed before, today long forgotten. (Twidale, 1993)

Often, after a while, the users get more familiar with the new tools and start using them in new ways, using more of their potential. A very concrete example of this is the early farm

tractors which had reins instead of a steering wheel - soon the way of doing the work was developed and the use of a steering wheel became more appropriate. (Twidale, 1993)

Metaphors as a Creative Tool

Creative processes often involve a combination of familiar concepts into new ones and here metaphors can play an important role. The use of common metaphors, for example in a working group, can help to intensify the dynamics within the group but also to stimulate new visions and concepts.

To see one single phenomenon in the place of another which has a much more developed domain, evidently creates visions on how the first one, and its domain, can be developed. These metaphors, that act as catalysts for new visions, is called Generative metaphors, and are found in both science, technology, politics and so on. (Schön, 1979)

Metaphors in Design of User Interfaces for Computers

The word metaphor is often used to describe certain properties of computer software, and one of the objectives of this investigation of metaphor is to investigate how metaphors work in the computer context, and how the terminology might be developed.

Computer systems are in general built up by several shells, or interfaces, of which the user normally just sees the most superficial one. The software code, 0's and 1's, are controlled through a program language, which forms the basis of the operating system which on modern computers is visualised with symbolic, graphic objects on the computer screen.

When using the computer, the user activates a "User Conceptual Model" (Salmon and Slater, 1987), "the set of concepts that the user invents, acquires and infers to explain how to use the system". The User Conceptual Model is part metaphor and serves to explain the meaning of the actions carried out, instead of showing what is happening technically.

The basic concept behind a graphic representation is often referred to as the "metaphor" and the most well known is the Desktop Metaphor that the Apple Macintosh, introduced in 1984, takes most of the credit of. Metaphors can be also used on detail level - one example is the Macintosh Trash Can metaphor for deleting documents.

Sometimes, a scenario from the real world is used, for example a picture of a desk, were some parts of the image are clickable, acting as invisible buttons. This can sometimes help to establish a metaphor, but sometimes it is simply a matter of decoration with no real impact on how the system is interpreted and used. This can be compared with the rhetorical view on metaphors.

It is important to understand what is metaphor, what is a representation and what is a visual scenario. These terms are often mixed up.

Some system designers believe that metaphors are useless - this is a result of an over-implementation of visual scenarios but also of a confusion about what a metaphor actually is.

To understand the use of metaphors in computer systems it, there is one interesting aspect on Swedish computer terminology. Long before Apple even existed, computer operating systems have used concepts like "file" and "directory". The Swedish word for "file" is "fil" which has completely different connotations. The English word means "number of documents, a group of information" while the Swedish word "fil" refers to the Swedish word for "lane" and the French word "filet" ("fillet") - which means string, just like the

string of 0's and 1's that basically make up a file. When you say "fil" in Swedish, no one thinks of piles of paper.

Analysing different computer systems with "metaphorical eyeglasses" shows that the basic metaphor "THE COMPUTER IS AN OFFICE" is present in most operating systems. A user of a conversational operating system (Löwgren 1991) like MS-DOS or UNIX, sees no object on the screen, but still uses a mental model where directories can be put into other directories and so on.

Consequently, the "Desktop Metaphor" of Macintosh was not new in 1984. There isn't even a desk present visually, the desktop is only a word in the Macintosh terminology. It is rather the context created by the objects put together that creates the Desktop concept. This context, in this case created by the desktop objects, helps to explain the objects - a truly metaphoric situation.

What Apple actually did, introducing the Macintosh interface, was to reinforce the "Office Metaphor" by making different system objects not only visible but controllable through direct manipulation. New objects, like the Trash Can were added - obviously the "Office Metaphor" was a generative one. Through direct manipulation, the analogy with real life was so much stronger, but the basic office metaphor was still the same.

Computer interfaces can be created using different kinds of analogic, symbolic or simply logic representations, but there must always be a metaphor - if it is not planned by the system designer, it will be improvised by the users who will use analogical thinking when their experiences are insufficient. (Allwood 1991) There is actually no way to create a meaningful interface without using a basic metaphor - menus, buttons, sliders, even clickable words are all analogic representations based on a basic metaphor like "the system is a control panel".

On the other hand, if the metaphor is compatible with the actual domain of the software, as well as with the background knowledge of the user, a much deeper and more instant relation between the user and the system can be established. The on-screen representations can be made in many different ways, where some of them will reinforce the users interpretation, and make the interaction more fluent and natural. A basic metaphor can be established and maintained with very simple representations, whereas an over-detailed representation without an appropriately related metaphor only can result in instant impressiveness.

Tropes - the Beautiful, Less Intelligent Cousins of Metaphor?
Metaphors are powerful, can create new meaning and explain complex structures, but how useful are other kinds of non-literal language, tropes like metonyme and so on?

There are several different kinds of non-literal expressions, tropes, that can be used for different rhetoric purposes: making the language more beautiful or to make a statement less offensive, more abstract or even clearer. Using humour, things can be expressed that otherwise would be impossible. In the same way, different tropes can help to present a message in a more modest or abstract way.

Tropes can be used to reinforce representations of a metaphor, or even help to create metaphor, but they are usually in themselves more superficial and do not actually create new meaning.

Metonym and Synecdoche

While metaphor is a concept that involves two different domains, metonym uses a transfer of meaning within the same domain. One example is "the throne" as a metonym for "the king", both expressions meaning the same thing, both emerging from the same domain.

A special case of Metonym is Synecdoche, where a part stands for the whole, for example "the jaw" could stand for "the shark". (Tepper 1993)

An example of practical applications is the use of graphic symbols or pictograms on control panels (Monö, to appear 1997), computer screen symbols and so on - often, due to lack of space or for graphic clarity, one part is chosen to indicate the whole, for example a wrench might represent mechanical service.

At first, metonym, and synecdoche, seem to work in a similar way to metaphor, but the mental models that they create are simple and superficial, compared to metaphor that create profound and often dramatic concepts. (Tepper 1993)

Comparison and Simile

Simile is a rhetoric way of exemplifying the properties of a phenomenon, for example "He was strong as a horse". A comparison deals with the actual differences - and similarities. (Miller 1979)

Allegory

Allegory is a non literal way of language, where the domain is changed for another. It is often used in politics or in other contexts where you are not allowed to tell the real story. (Ricoeur, 1977) For example a conflict between two countries can be described in a more modest way as a fight between two boys. This way of using allegory is related to euphemia (Gibbs 1979), the use of more socially accepted expressions. On the other hand, use of metaphor within an allegory, in this case a boy fighting a lion, can have the opposite effect and by creating stronger connotations make a more firm statement. Allegory can also be used for concealing technical - or in other ways complicated - aspects of a product or phenomenon. Allegory is consequently a stylistic way of treating a message, that can use metaphors, but which is not metaphorical in itself.

Paraphrase

A Paraphrase is a reconstruction of something else, in a new shape, but with the same basic structure. Apparently, Paraphrase in itself does not imply any transfer of meaning except for the reference to the original concept (if this one is evident). (Tepper 1993)

Litotes and Hyperbole

Litotes is another word for "understatement", a rhetoric way to emphasise a certain aspect through a modest presentation. Hyperbole is another word for "exaggeration". Litotes and Hyperbole are especially useful for emphasising values.

Irony and Oxymoron

Irony, originally "humiliation through obvious flatter", today means to express one thing obviously saying the opposite. Irony has been pointed out as an important attribute of "Generation X" (from a novel with the same name by Douglas Copland), a generation raised during the 1970's whose over-exposition to media and advertising has undermined their confidence in absolute statements.

Oxymoron is a contradictory expression, such as "screaming silence" - similar to irony but with the two juxtaposed concepts obviously present. (Backman, 1993)

Like Litotes and Hyperbole, Irony and Oxymoron are useful for emphasizing values, but they obviously do not create a transfer of meaning.

<u>Dead metaphors</u>

Dead metaphors are old, well known metaphors that have lost their metaphorical meaning by convention and which have become commonly used expressions - a natural process as new expressions often are created by explaining the new phenomenon through familiar terms; one example is "The Eye of the Needle". (Backman 1991)

<u>Idioms and Proverbs</u>

Idioms are commonly used expressions that sometimes are based on metaphors. An idiom like "spill the beans" has its origin in basic metaphors (see below) like "IDEAS ARE OBJECTS" and "THE MIND IS A CONTAINER". Proverbs have a similar function, but are formed by a more explicit message. (Gibbs 1979)

Concept, Metaphor, Scenario or Representation?

The concept for a computer interface can hardly be developed without using any kind of metaphor - the complexity of actions, and the lack of "actual events" calls for a close metaphorical integration with the spontaneous mental model of the user. If no metaphor is used, at least not consciously, a metaphor will be created by the user, far from any control by the system designer.

Scenarios are virtual situations created on the computer screen. Scenarios often use events and objects from real life. Sometimes scenarios are used for visualising a metaphor, but in some cases scenarios have been used without sufficient integration with the metaphor, causing a week integration with the user and a bad reputation for metaphors. Löwgren uses the term analogical metaphors for metaphors that use objects from the real world - this concept includes both the objects and the basic metaphor behind them. It is important to point out that the metaphor is the concept, not the representations, nor the scenario.

Scenarios sometimes are created by the objects representing different components (objects, processes, actions...) - one example of this is the Macintosh Desktop.

Note that scenarios on the screen should not be mistaken for the real-life scenarios (written stories about when and how the system is used) often used in the development of computer systems.

The different components of the system must be supported by representations of some kind - conversational commands, symbolic buttons or direct manipulative objects.

Conclusion: The Interface *concept* describes how the *representations* should be organised and presented. The concept generally uses a *metaphor*, for creating the mental model in the mind of the user; the metaphor is visualized by a *scenario* on the screen - the scenario is made up by an *environment, objects* and *events*, all acting as *representations* of what is "actually happening" in the computer.

Using Metaphors

The less "self-explaining" a product (or a concept) is, the more suited is the use of metaphor. For example, a physical object or a machine often can be understood by comparing its actual features with features of other objects, a machine can often be understood by "opening the hood", looking at the mechanical solutions and so on.

On the other hand, abstract products and services, computer software, medication, electronics and similar phenomena has an "inner structure" that is dependent on specific domain knowledge or that even is incomprehensible for experts. In this case the

properties of the product (object, service, concept) has to be conveyed by something else. The more complicated and abstract this message is, the better suited is the use of metaphor.

Jonas Löwgren (1991) has pointed out one problem with metaphors, that they sometimes say too much and too little, at the same time.

Another problem is that in some cases, users from other cultures, might also be excluded by a certain metaphor.

When choosing a metaphor it is consequently important to search for one that is not too limited, but that still uses the potential in the background experience of the user. It is important to use the metaphors that first come to the mind of the user, in the actual context. (John Carroll: Michels 1996) The background experiences, and attitudes, of the user should therefore be examined.

The potential of a specific metaphor should be judged from the criteria already mentioned above:

- users background knowledge
- general conventions and
- the actual context

but also

- the flexibility and practical implications of the metaphor, in relation to the actual application.

According to Carroll it is important, after defining metaphor candidates and examining the connections between these and (in this case) the software, to identify anomalies (parts of the metaphor that are in conflict with use etc.) and to define design strategies that help the user to control these anomalies.

Using Tropes
Tropes of different sorts should be chosen from the criteria of how well the support the basic metaphor. Use of "non-supported tropes" should be considered in relation to the risk of a damaged concept or metaphor.

Tropes are mainly stylistic elements, so the social implications should be judged carefully.

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