

Analyzing the history of specific product categories

Special project

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Guide

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Abstract

A chronological categorization holds good for the evolution of most products, but that is really not exactly how a product design evolves. Design evolves with influence from a number of elements. It is not always the external elements but also the elements contained in a few old designs of the same product.

So eventually every new evolution of the product is not only influenced by the previous design, but also by the design of other products during the same time-frame, as well as the previously designed products.

A method of classification of such products is looked into in this project. Proposed initially by Lakoff, the Radial Structure has been applied to see how classification of various products can be done and what advantages it provides to product designers.

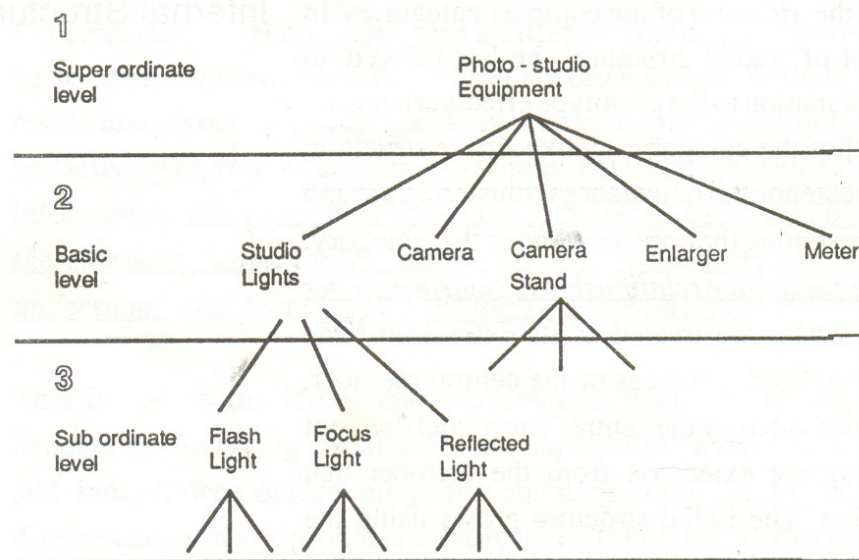
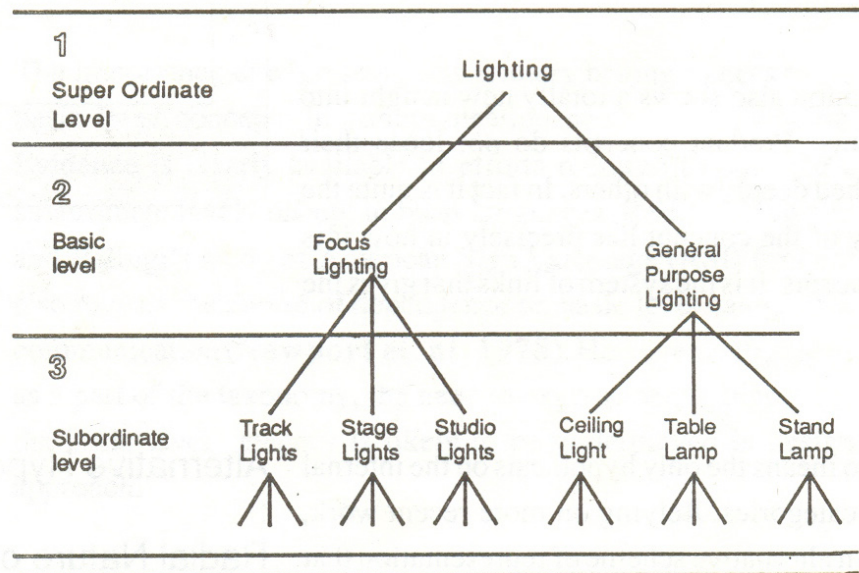
Introduction

Each individual has his own ways of perceiving and understanding objects by reading the visual clues given out by them. A closer study of this can reveal exactly how an individual responds to an object and categorizes it. Furthermore this reveals what visual features in an object would lead to its specific categorization.

Artificial Intelligence cannot recognize and categorize objects as efficiently as the human mind. Moreover the categorization done by the artificial intelligence bears no resemblance to the type of categorization done by the human mind.

Product design doesn't evolve stage by stage or in chronological order. Rather the evolution is part of a larger process of external influences and quite a few internal influences from the category itself.

Belonging to Multiple Categories



The Radial Structure

Product categories are very rich in information, but if not displayed correctly most of the information is lost.

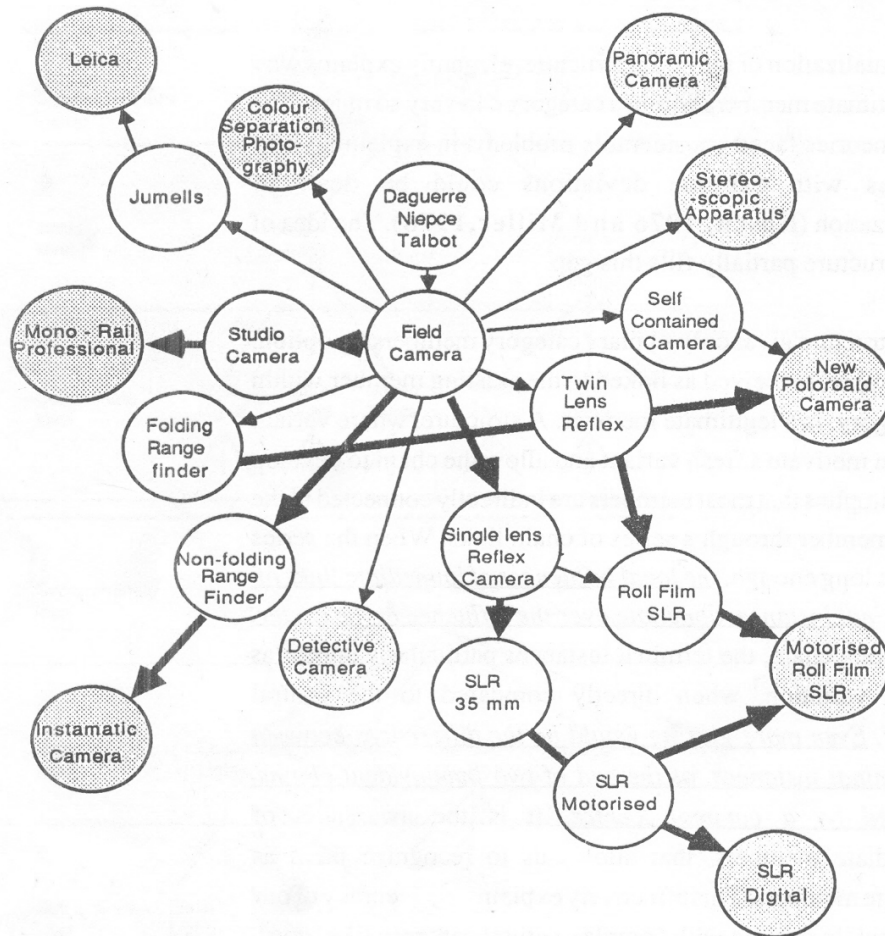
Elanor Rosch proposed the concept of structuring data in three levels. The subordinate, basic and the superordinate level. As an example the categorization of cameras and photography equipment is given.

The categorization still is very general, it does not give any information of influences in design or the complex relationships products develop amongst themselves. Product design and styling always involves influences from objects and products outside the level or sometimes even outside the category.

The structure proposed by Rosch was very symmetric and organized.

George Lakoff proposed an alternative structure for representation. He proposed a structure which had a central member, which represented the core meaning of that category. The sub-categories or instances would cluster around the central member.

The structure on the next page depicts how a complex radial structure is and how much of information it displays. The difference in the structure is prominent.



The major difference in this structure of categorization is the presence of the central member and its unique relationship with the extensions or other instances. The radial structure does not fully concentrate on deriving an extension from a central member.

The radial structure has a certain asymmetry as compared to the structure proposed by Rosch. The radial structure grows using the chaining principle, where the central member is linked to the other members, which in turn are linked to others. So the new variations are indirectly connected to the central member.

The radial structure does not show an apparent distinction between the super-ordinate, basic and the sub-ordinate level categories. On the other hand it is implied that the central member is the most typical instance and the further you go away, are the atypical or the less representatives.

The radial structure does not have a very specific or organized tree like display. The structure is more focussed on the categorization of the products around the central member. Only when the sub-categories are substantially independent, the representation will show them as tree-like substructures.

Application of the Radial Structure

The radial structure is not as simple and neat as the taxonomic structure proposed by Rosch and sometimes it is seen as difficult to perceive too.

But this structure is very useful in understanding the framework of development of any specific category. When analyzing a product it is very important to know its relationship to the surroundings and finally its relationship with the core member.

The advantage of this structure is that it allows the designer or the stylist to get an overview of how the design for the specific product has progressed over the years. It also depicts what typical is and what is atypical.

The radial structure eventually gives information to the designer about the outer limits of formal exploration that he can explore, to the extent where the unique identity of the category isn't lost. Knowing the structure of the product category gives us the clues to operating more predictably in the semantic space of the category.

Lets see a few examples which allow us to see the applications of this structure.

Example 1

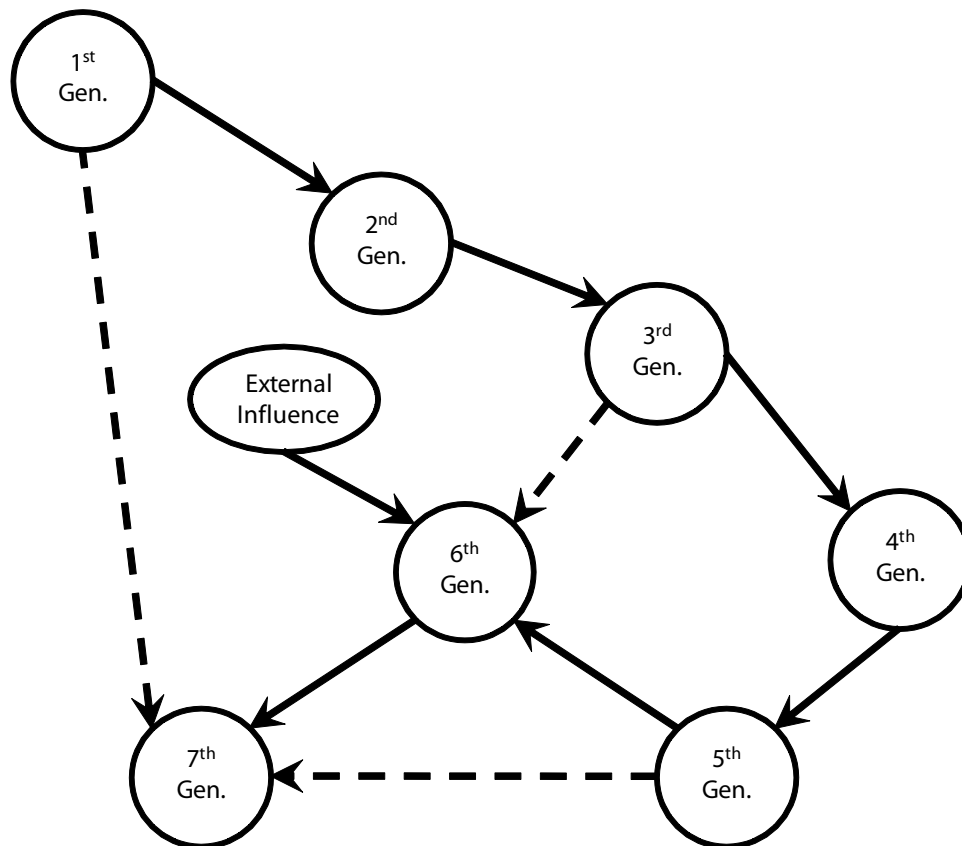
Mercedes-Benz have been one of the pioneers in the field of automotive styling. From the earliest Mercedes-Benz cars to the cars being manufactured today each car has been an epitome of luxury and has its own specific style statement.

The cars have also been categorized on the grounds of their styling details into various classes. The class of cars looked at here are the CLK-Class of cars.

The cars from the 1st Generation to the latest 7th Generation cars are shown in the picture on the next page. The chronological order of presenting the models is typical for understanding how the model has progressed over the years.

But if observed closely, the product design has evolved a bit differently. There are influences from a lot of previous generation vehicles and also some external to these vehicles too.





The diagram on the left takes us through design evolution process.

The 1st Gen. vehicle developed into the 2nd Gen. and subsequently this continued till the 5th Gen. vehicle. Though the evolution of this CLK-Class has been highly influenced by the design improvements in the E-Class of Mercedes-Benz models, the evolution has been almost on similar grounds to the E-Class saloon. A major influence though is noticeable in the 6th Gen. vehicle.

The major external influence was the paradigm shift in the design of the E-Class, which shifted over to the twin-headlamps in the 6th Gen. of the vehicle. This vehicle also borrowed the design of the rear windscreen from the 3rd Gen. vehicle.

The latest 7th Gen. CLK has more of design influences than noticeable to the naked eye. For starters it takes a major influence from the very 1st Gen. vehicle. The front fenders are reminiscent of the style followed in the 1st Gen. vehicle. The headlamps have a character of their own and stop following the E-Class vehicle, moreover they are an evolution from the 5th Gen. vehicle.

Thus we see that in the case of Automobiles, Product Design and Styling does not follow a certain fixed path of evolution. The influences are found from all over the category.

Example 2

Let us apply the same type of technique in understanding the evolution of products. The product evolution being considered here is that of the Coca-Cola bottle. The development of the product from the years has been mapped by the company.

Again if we look closely we can observe that a lot of design influences are taken from previous generation designs and some have also been completely ground breaking designs.



The diagram on the left takes us through design evolution process.

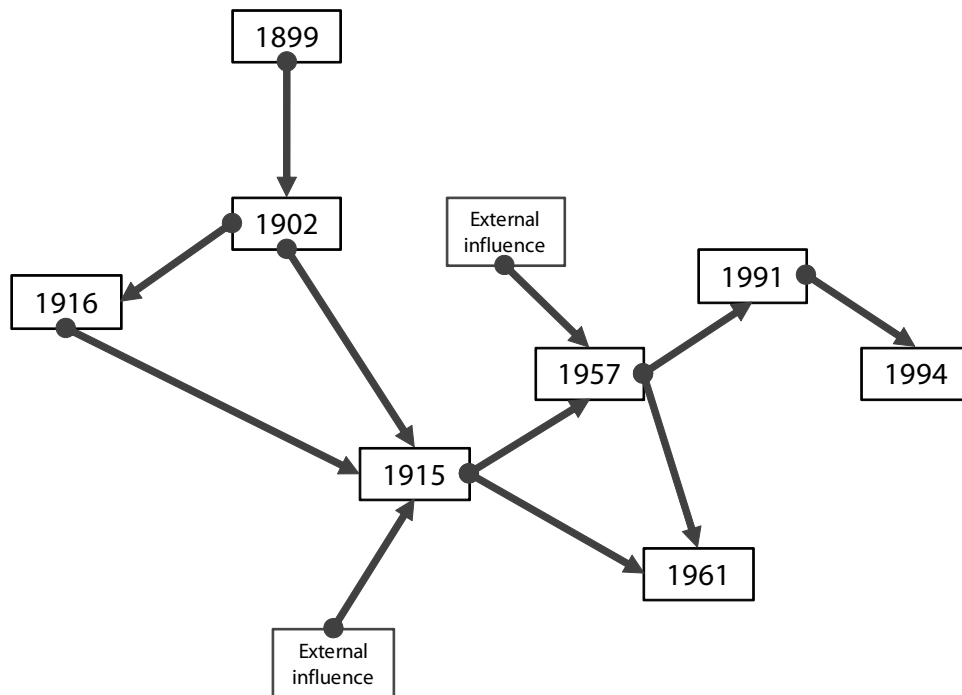
The first bottle was purely inspired from a milk bottle of the time. The next version that came in 1902 was designed to create an identity for itself, though an evolution from the previous generation, it featured prominent graphics stating it was different.

The next design evolved from a beer-bottle in 1916. This was just to bring in a character of an alcoholic beverage in a non-alcoholic beverage. But very soon a completely new design evolved. This was probably inspired by an external influence, not primarily related to any previous design, though it featured a few design cues which defined the brand identity.

Further through the years the evolution of the design of the bottle are seen, where features of the graphics and the branding keep shuffling between being engraved or printed. They borrow influences from two generations back.

Finally with technology and materials progressing, the plastic bottle with stick-on graphics was introduced in 1994.

Thus we see that in the case of soft drink bottles, Product Design and Styling does not follow a certain fixed path of evolution. The influences are found from all over the category as well as outside the category.



Mobile phone categorization

Nokia has been one of the primary manufacturers of personal communication devices and mobile phones since the invention of mobile communications. The company also has a lot of firsts to its name. It has always pioneered ideas which the competitors tapped into much later.

The Nokia phones have created a niche for themselves of being customized and easily usable. The company has also kept the customers busy by periodically coming out with new and fresh models. Nokia has also explored new realms in design and technology, with styling not being left behind.

The next page gives a time-line of every Nokia phone ever made. It starts from 1982, till the year 2006.

There is a different classification based on the type of the phone. This contains, candy-bar type, flip-type, slider-type and the rotate-type of phones.





The focus was then shifted to Flip-phones, mostly the phones were of Nokia. Primarily these type of phones were very simple flip-phones. Later on their higher versions had features like a camera, dual display and even a touch screen navigation.

The most important styling feature though in any flip-phone is the presence or the absence of an external antenna. The very first flip-phones had an extendable antenna. The antenna needed to be pulled out so as to improve the quality of the signal.

This then evolved into the short fixed projecting antenna seen on most phones. Most of the external styling evolved to incorporate the external antenna as a styling feature. The cross-section of the antenna kept changing shapes, from round and oval to rectangular too.

Finally with the introduction of the internal antenna, more emphasis was on the design of small and sleek phones. Other cellphone manufacturers followed a similar styling trend with their products too.

But there were also a few phones, which had ushered-in a style revolution and weren't from Nokia. Motorola had tried to fuse together features of a PDA with a flip phone, it also tried to bring in sleekness by making its phone ultra slim. Motorola took dual display simplicity to new levels by using icon based lights.

The next pages display the phones being considered for classification.



NOKIA 282
(1998)



NOKIA 3110
(2000)



NOKIA 3108
(2003)



NOKIA 6115
(2003)



NOKIA 9110
(1998)



NOKIA 3001
(2004)



NOKIA 6000
(1998)



NOKIA 9000
(1996)



NOKIA 6108
(2003)



NOKIA 9210
(2000)



NOKIA 9000
(1996)



NOKIA 6000
(1998)



NOKIA 6000
(1998)



NOKIA 6108
(2003)

NOKIA 9500
(2004)NOKIA 6165
(2005)NOKIA 6801
(2001)NOKIA 6102
(2005)NOKIA N71
(2005)NOKIA 6103
(2006)NOKIA N95
(2005)NOKIA N95
(2005)NOKIA 6800
(2002)NOKIA 6161
(1998)NOKIA 670
(2005)NOKIA N90
(2005)MOTOROLA K1ZR
2008

Understanding Design Evolution

The inspiration for a flip phone probably came from the 'compact' which is a portable make-up kit for working women. Nokia took the idea into a cellphone. The first cellphone to emerge in this range was the Nokia 282, the first-ever flip-phone, which came out in 1998.

The Nokia 8887 followed a few years later, in 2001. This was just a first revision of the Nokia 282. The 8887 featured a sleeker battery-pack, a better moulded body-shell, and a fixed external antenna.

Later Nokia introduced a model in 2004, but the major onslaught of flip-phones occurred in the years after 2005. Nokia had more flip-phones on the shelves than any other manufacturer. With the introduction of the internal antenna, the entire body styling of the mobile phone changed.

Depicted here is how the basic flip-phones developed, the further we give details on specific product developments.



Product Range



Revision I



Initial product



Inspiration



Product Range



Revision I



Initial Product



External Influence



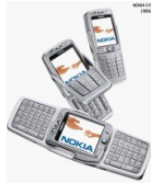
When cellular phones were invented they were targeted at the businessman to allow him to stay in contact with his office. Later on Nokia started looking at adding to their product range. The inspiration came from the digital diary and the business Laptop.

The first Communicator series device was the Nokia 9000 in 1996, which was a digital diary with better graphics, a spreadsheet and E-mail. Incorporated into a phone, the Nokia 9000 was very compact for all the features it offered.

The revision of the phone was seen in the Nokia 9110 which came out in 1998. this had a better designed external body and keyboard. Finally in the year 2000, Nokia introduced the Nokia 9210. This Communicator device came with a colour display and the buttons had an improved sensitivity.

Ever since the first Communicator series phones Nokia has been making a serious effort to reduce the size, while packing in more and more product features. The styling always looks at trying to make the phone look interesting with two-tone colour finishes and bigger display screens. Over the last two versions the phone looks more proportionate as compared to the earlier models.

Product Range



They say that to come up with ground-breaking ideas you need to look outside the product category for influences. Nokia 6800 was one such example.

Revision I



The external influence plays a very vital role in bringing out an initial product. The flip-top phone series is one such example. The urge to have a full functional keyboard was put together in a flip open phone which resembled a normal candy-bar phone when closed.

The phone has kept on improving and now has a business edition also to its credit.

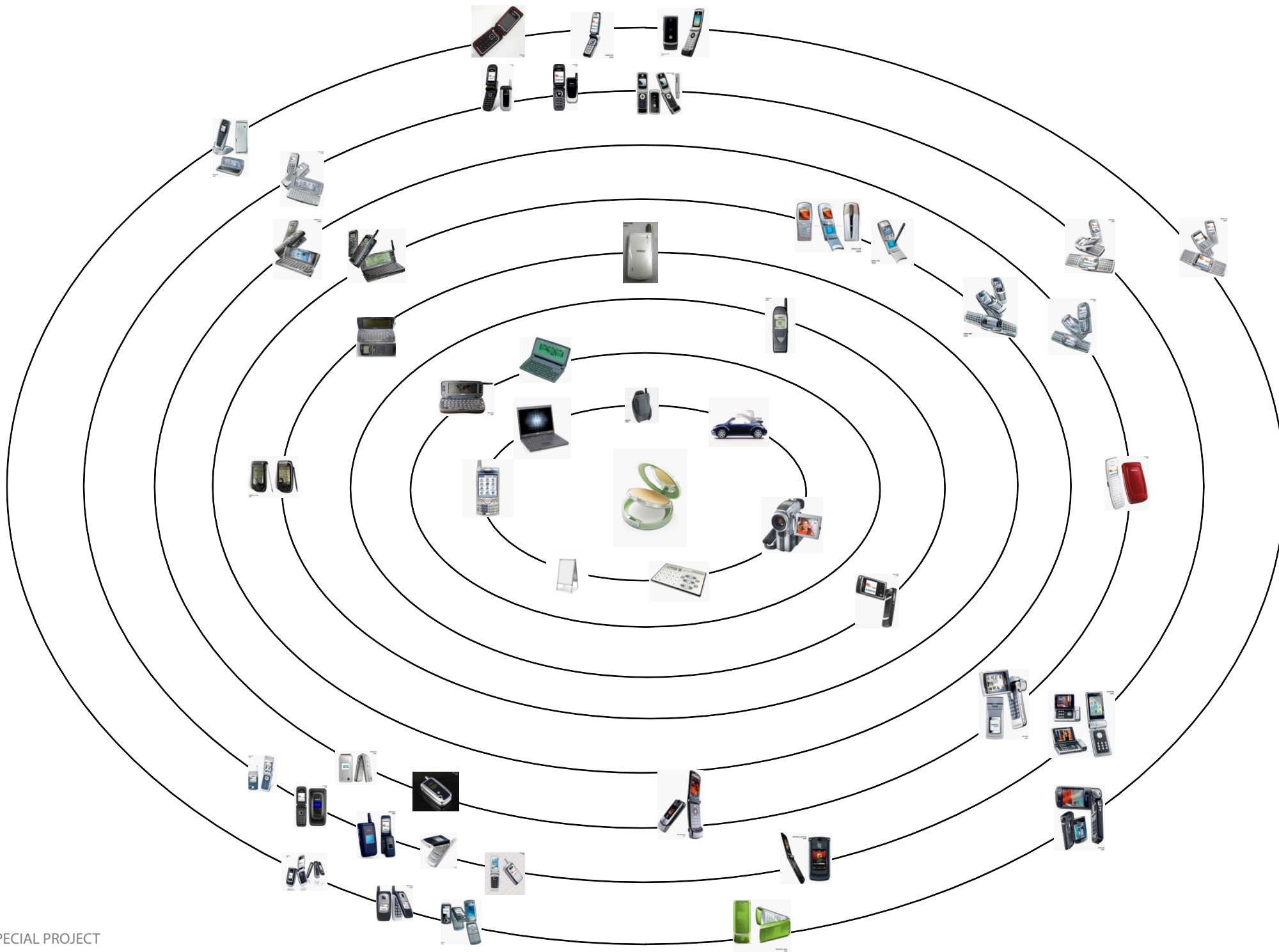
Initial Product



The next few slides talk about the classification attempts made to represent the flip phones.

External Influence

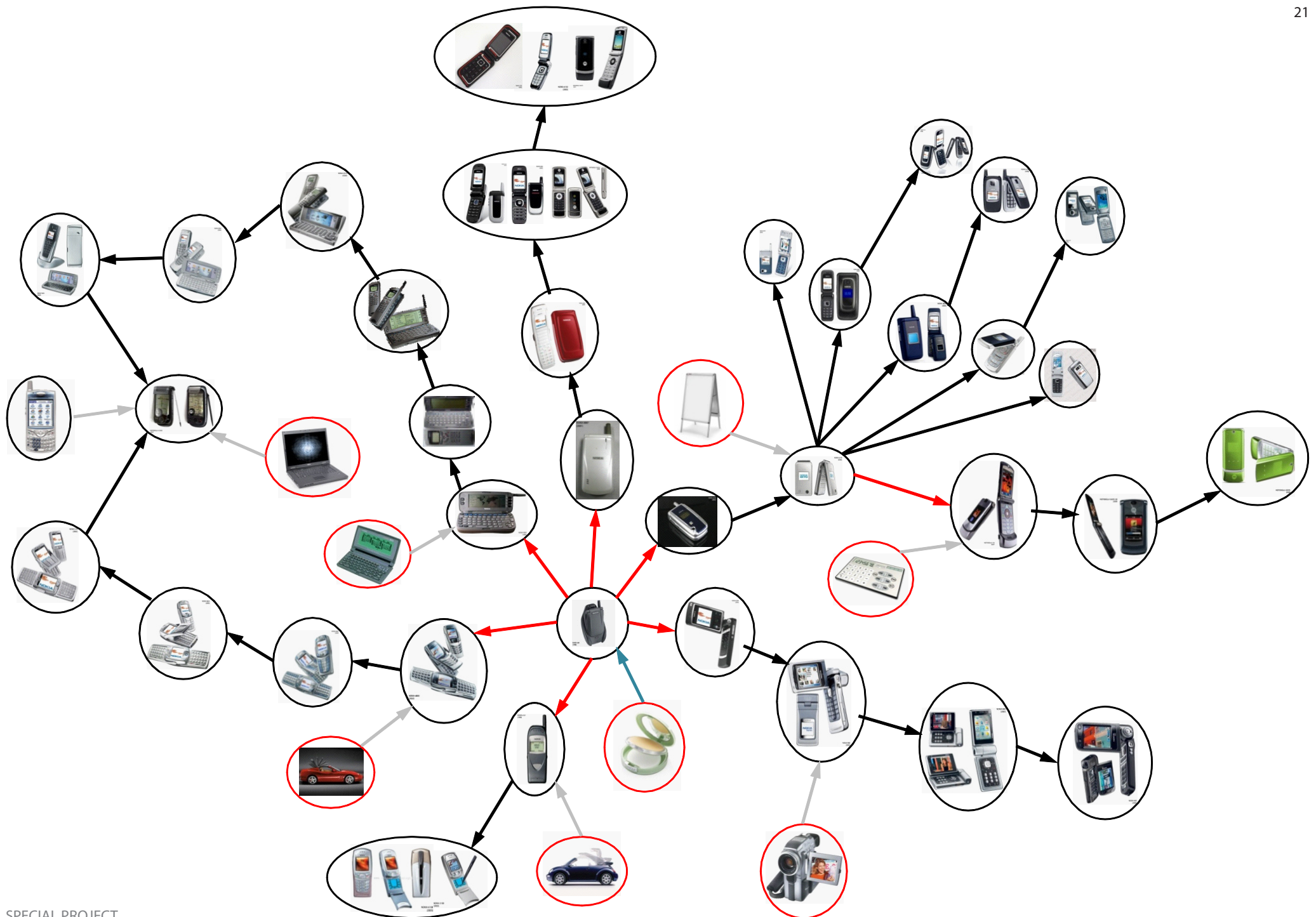




The initial classification was done to see how phones evolved. The versions were checked and they were arranged accordingly.

The initial influences were arranged at the core and the products were arranged at the outer periphery as they evolved. This gave an idea about the products but their relations weren't defined properly.

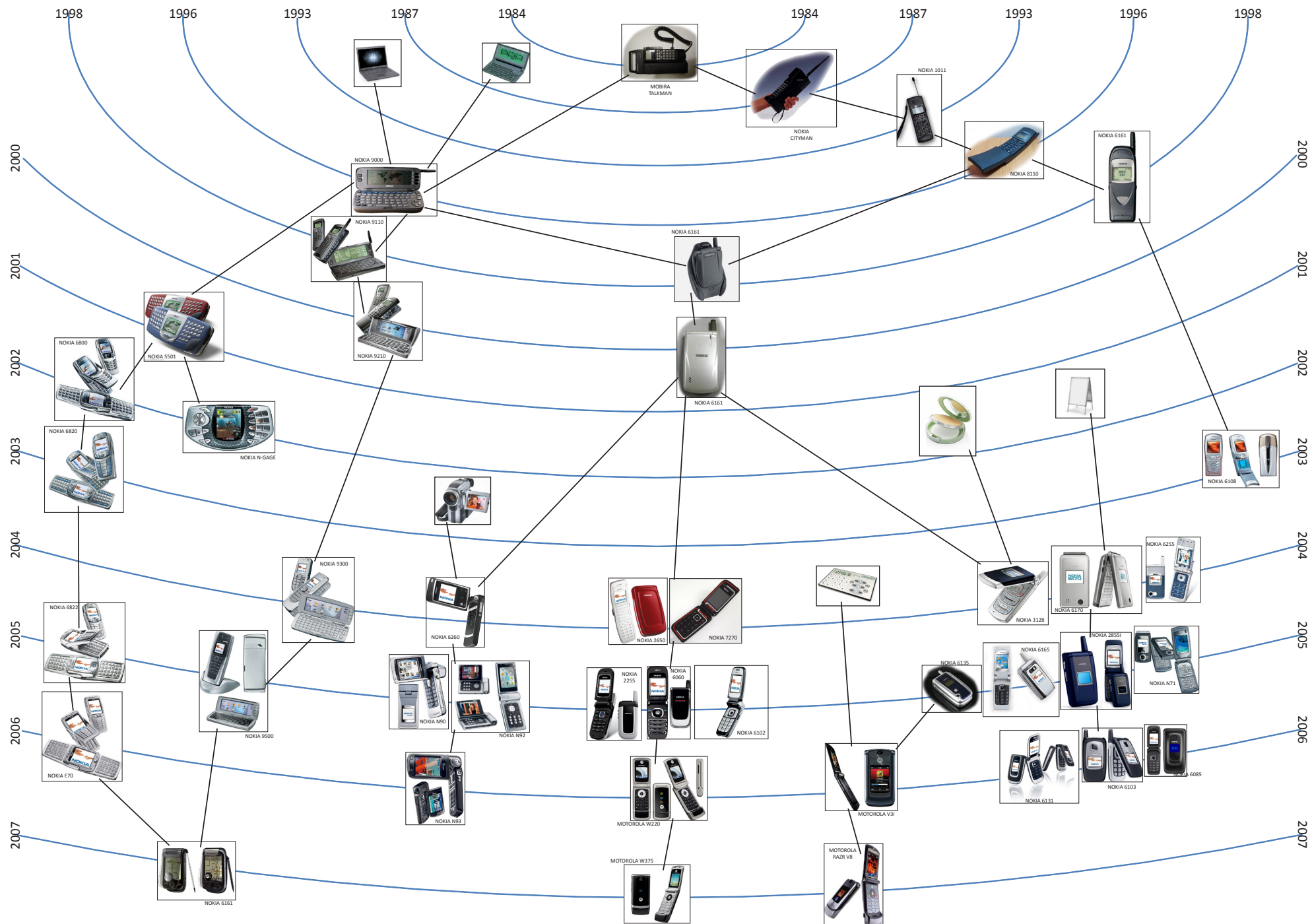
Moreover a definite over-crowding of elements was seen towards the outer rings.



The second iteration looked at relationships between objects. The objects were arranged as they evolved.

The inspirations were studied and these are the ones marked in red. These inspirations provided the new design introduction.

The interlinking structure in this structure is quite developed and relationships have been established.



The third iteration fused together the elements of the first and second. The circles, which form the base, were further fine-tuned to make the layout of the years that the evolution would consider.

The roots were traced properly and these were chronologically depicted. The influences and their relationships were also explored and depicted.

The final iteration shows the development of the radial structure for mobile phones.

Final Proposal

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Research papers

The Structure of Semantic Space – new issues in Product Semantics.

Pages 41 to 68

(Product Semantics and Beyond – compilation of papers by Prof. Uday A. Athvankar)

