

Making the Computer Masculine

The historical roots of gendered representations

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Abstract: The new field of computer occupations has acquired a masculine character in a very short time, even in a period in which women's participation in the labour market increased significantly. In this article, I want to show how the computer on symbolic level became inextricably bound up with prevailing masculine values as early as the '50s and '60s. The empirical material is based on an analysis of newspaper articles on computers from this period. I will argue that the brain metaphor played an important role in transferring masculine values to the computer and to the computer worker. At the end, I will discuss other meanings that could have led to a less masculine image, but I suggest these meanings were less powerful than the brain metaphor.

1. INTRODUCTION

Computers and masculine gender stereotyping are very important parts of the 20th century heritage. At the beginning of this new century women still are strongly underrepresented in computer occupations and only a few girls show interest in joining computer clubs. In this paper, I want to look back to *historical* processes that aligned computers with the masculine domain. This may help us to better understand of the complex interrelationship between masculinity and computers. Thus, it might increase insight into the reasons why present intervention programs to stimulate women's participation in computing have not produced the desired results.

In this article, I will focus on the gendering of the symbols and metaphors that were used to give meaning to the new technology at the crucial period when electronic computers started to diffuse in society the 1950s and the early 1960s. At that time, the electronic computer was a radically new

machine with no comparable predecessors. This aroused a public discussion of how to define the character of this new technology and evaluate its potential societal impact. In discussing this, new frames of references were developed to position the new technology. These frames of meaning are likely to have influenced other processes on an organisational and occupational level that constituted the computer's gender-biased entrenchment in society [10].

I analysed approximately two hundred Dutch newspaper articles from the period 1955-1965, varying from short accounts to larger discussion articles. At that time, these articles were collected by the director of the governmental computer centre. They represent the public discussion about the introduction of the computer in Dutch society.

The masculine representation of the computer was by no means a foregone conclusion. When the first electronic computer, the Electronic Numerical Integrator And Calculator (ENIAC), was presented to the public in 1946, the word 'computer' had a completely different meaning than it has nowadays. 'Computers' were persons, often women, with training in mathematics, who did the tedious work of solving and calculating complicated equations. In the United States as well as in the Netherlands, it was women 'computers' who operated and programmed the first electronic machines since this was a natural continuation of their previous activities.

Soon the women operator/programmers disappeared from the stage. According to Kraft [8] "the ENIAC-girls became the world's first computer programmers largely as a result of a serious miscalculation as to the skills involved." The designers of the computer, mainly electrical engineers, were preoccupied with the 'hardware' and thought of providing the machine with operating instructions as hardly more than a clerical detail. Although other historians [6] do not agree with Kraft, the point I want to make here is that the concept of 'computer' lost its meaning of the (female) human being doing calculations. In the 1950s and '60s, a new meaning of a masculine connotated 'thinking machine' was constructed. The use of metaphors played an important role in the construction of this masculine image.

2. THE TOOLKIT: TRANSLATION AND METAPHORS

Modern feminist theories have taught us to see gender not only as the social derivation of biological sex differences, but as an analytic category within which we think and act, as a structuring principle of our social (and physical) world. All aspects of society, including technology, are saturated with gender. Sandra Harding [3] distinguishes three distinct processes that

constitute the gendered society: 1) a process in which dualistic gender metaphors are assigned to various perceived dichotomies; 2) based on these gender dualisms social activities are organised: the division of labour by gender; and 3) individual identities are socially constructed in a gendered way. Harding labels these three aspects respectively with gender symbolism, gender structure and individual gender. The construction of a gendered society is a complex interplay between these three aspects of gender. The main aim of this article is to show how, on a symbolic level, the computer became associated with masculinity from the very moment that the computer came out of the research lab and was presented to society.

The question of *how* prevailing gender definitions are transferred to new artefacts and new situations has been elaborated at an interesting way by Kelly [7]. She shows how gender-differentiated ideologies and behaviours that children have developed in previous socialisation, are transferred to the new context of physics education and gender the meaning of physics. A similar reasoning can be used to describe the process in which a new technological artefact acquires a gendered meaning. When a new artefact is diffused in society, one could say that successful integration means that it is fitted into the prevailing cultural frames. Hence, the gender aspect as a part of all cultural frames is 'translated' to the new artefact. The question that can be posed now is how is the gender frame 'translated' to the new artefact?

An effective way to couple new artefacts or new ideas with the prevailing cultural frames is through the use of metaphors. Metaphors are intended to communicate, to link new artefacts or new ideas to existing ones. Gender metaphors are a powerful mechanism in gendering social activities and artefacts on a symbolic level. Hesse [5] adheres to the *interaction view* of looking at the metaphors. In this view, "the metaphor works by transferring the associated idea's and implications of the secondary to the primary system. These select, emphasise, or suppress features of the primary...the primary is 'seen through' the frame of the secondary" [5, p.162-3]. As such, they produce new and specific meanings (intended or unintended) with which we value and understand the new artefact. Hesse, who adheres to the interaction view, sees metaphors as much more than just a stylistic use of language. Thus, not only gender metaphors can couple social activities and artefacts with gender, but also metaphors in general can translate gender aspects from one system to another new system.

3. THE BRAIN METAPHOR

The most notable metaphor of the electronic calculating machines was provided by the human brain. In the fifties, the popular name of computer

was ‘electronic brain.’ Electronic digital calculators were conceptually completely new machines and had no resemblance with their mechanical predecessors. Comparisons with existing mechanical and electrical machines were inadequate to explain the working of these machines. The brain metaphor was appealing, the more so as the scientist Norbert Wiener (who invented the word ‘cybernetics’) also made explicitly the comparison between computer systems and the biological neural system. One could read in the newspapers for instance that:

“the working principle of a neuron was similar to that of electrical impulses in a electron tube. The only difference between an electronic brain and a human brain is the number of neurones versus electron tubes” (Het Binnenhof 5-9-1959, Transl EvO).

Although this metaphor for computers does not directly refer to gender, seen from Hesse’s interaction view, it is plausible that the brain metaphor does link up the computer (primary system) to prevailing masculine symbols associated with the brain (secondary system), and thus functions as a vehicle for translating gender. The brain and thinking have historically always been situated in the male domain [4].

The brain metaphor was a dominant image in the fifties and it was still lively, although not dominant anymore, in the middle of the sixties. It generated two different kinds of emotions. First, one can see a real fascination with the possibilities of these machines. In the domain of calculus the computer exceeded human ability in a way which was hard to believe. The articles regularly contained phrases like: “The enumeration of 10.000's of numbers in a second is mere child's play to the computer, and beside this it is infallible.” But on the other hand the metaphor raised fear. Fear of future developments. “Could the electronic brain supersede the human brain?” and “The march of the machine-men with brains but without feelings” are characteristic titles of newspaper articles at that time.

Like the human brain the computer too worked in silence with only little flashing lights to show something happened inside the computer. This made the computer for those who had little knowledge of electronics and binary logic a mysterious and even weird machine. Moreover, computer manufacturers used this mysterious image to impress the public. IBM’s first electronic computer was put in operation in 1948 at IBM's headquarters in New York. It was a very large machine and contained 23.000 relays and 13.000 valves and ... it could be seen from the street! According to Bowden [1] “the machine in operation must have been the most spectacular in the world. Thousands of neon lamps flashed on and off; relays and switches buzzed away and the tape readers and punches worked continuously. Passing pedestrians affectionately christened it ‘Poppa.’” Many (American) companies, following IBM's example, accommodated their expensive

computers in glass rooms, preferably visible to the public. The computer had become a high status symbol for the modern world to be built after World War II.

4. THE ARTIST PROGRAMMER

In the fifties and the beginning of the sixties the brain metaphor not only marked the computer itself but also strongly affected the image of the computer worker. The brain metaphor led to an image of the computer worker that highly appealed to the masculine identity. In the preceding section it was argued that the brain metaphor made the computer a mysterious and potentially dangerous machine. So, controlling these machines was often depicted as an important and difficult task, as can be showed the in way the programmer was described in a full page article on the new programmer in the largest Dutch newspaper:

“It is important that many young people devote themselves to the most modern aspect of modern life: to give guidance to the unstoppable growth of the electronic extension of the human brain with its unpredictable possibilities - and at the same time make the results beneficial for all the others, who are watching with astonishment.” (De Telegraaf, 6-10-1963; transl. EvO)

The programmer was often portrayed in the newspapers as a specialist, as an artist who plays the computer like a pianist plays the piano or sometimes even as a magician. The computer as electronic brain gave high status to the “men-in-the-white-coats who were mysterious accomplices of an invisible power that apparently was well-disposed to the firm in question” (Nieuwe Rotterdamse Courant (NRC), 25-5-1965).

All these images refer to programming as an activity saturated with virtuosity. Explicit elements of the virtuosity are high status, expense, mystery, danger, and mastery - all elements that symbolise masculinity in our society [11]. All these elements were abundantly generated by the brain metaphor. This contributes to our understanding of why it was *men* that appropriated the domain of computer programming and operations.

5. ALTERNATIVE MEANINGS

The brain metaphor was not the only meaning that could be found in the newspapers. There were other, but less dominant meanings of the computer. The computer as ‘a business-economic tool’ led to other definitions of the computer and computer workers. The business world, less concerned with

status, instead saw automation as a means to efficiency. On the contrary, the brain metaphor only caused anxiety among the employees, and the ‘artist programmer’ was difficult to manage within the organisation. In the newspaper articles one can also find attempts to deconstruct the masculine images of computers and computer programmers. For example in 1964:

“The opinion that the average work in administrative computerisation is difficult and complex and unreachable for the less talented, is not true. Programming is not at all difficult and it can be learned by many. Talent for mathematics is not necessary, but the willingness to think precisely in a certain way is.”

This statement does not link the computer with masculinity as strongly as the brain metaphor does. But a positive coupling with femininity is not made either. Therefore, this meaning could not deconstruct the masculine gender that was constructed with the brain metaphor. On organisational level of labour, two masculine definitions of computer occupations were created. Programming was defined as a staff function and the computer operator got a technical label [10].

This meaning of business-economic uses was often related to a quite different image of the computer programmer. Programming was not about being an artist but was described as a conscientious and precise activity. Both qualifications, conscientiousness and precision, are often ascribed to women and were seen as an essential characteristic of typically female jobs at that time, such as data entry. However, in the newspaper articles few direct references to women were made in relation to computer programming. In the 200 articles, I only found one exception in an interview with a female programmer:

“It has been said that computer programming is the job for the future and the best programmers are intelligent girls who are good at embroidering because they have the patience and conscientiousness that is needed.” (Het Vrije Volk, 17-12-1966. Transl. EvO).

These less dominant meanings of computers and programmers have a much more gender-neutral character than the meaning constructed by the brain metaphor. The search for less masculine meanings might be a fruitful way to break the circle of technology, virtuosity, and masculinity.

6. CONCLUDING REMARKS

The dominant brain metaphor in the fifties linked the computer inextricably to social symbols that had (and still have) a strong masculine

character and therefore gave the computer and the computer worker an intrinsic masculine gender label. The computer acquired its gender label in the period in which women were urged to leave the labour market and to stay at home with their newborn babies. Most of the female 'computers' who operated and programmed the first electronic calculators disappeared from the stage for this reason. As in most male dominated fields, some women 'survived' and often made remarkable contributions, such as Grace Hopper, the mental mother of the programming language COBOL. She even got the first 'computer man of the year' award. But these pioneer women certainly were exceptions.

At the time of the rise of the feminist era in the mid sixties, computing was deeply masculinized in all three aspects of gender studies, through gender symbolism, gender structure, and gender identities. Not only computing itself had become masculine; it also had become a part of our social cognitive scheme with which we can make sense to the world. A Dutch advertisement for junior programmers in the late sixties results in a reaction from only two girls and more than a hundred boys: women and girls have abandoned computer programming as a means to shape their identity. Masculinity is also reified in the labour structure of the electronic data processing sector. Typical male elements are the impossibility of part time work, the strong emphasis on mobility, and the body shopping and job hopping culture. The masculinization of computing on all three levels of gender (symbol, structure, and identity) means that women still have difficulties in conquering this area.

Metaphors are a powerful way of aligning technology to masculine symbols. But, as we have seen, also other alternative, more gender neutral meanings can be found and adhered to and can even be constructed. Nowadays, feminists are aware of this symbolic power by actively aligning new technology like the Internet with female-connnotated communication instead of the masculine virtuous electronic highway. Dale Spender, one of the colourful proponents of women using Internet says: "Like the telephone, the connected computer is just crying out for women to use it" [12].

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