

## Mathematical Machiavellianism

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In the school year 1997/98 a new subject - statistics was introduced into the study program of teachers of elementary school at Pedagogical Faculty of University of Jan Evangelista Purkyně in Ústí nad Labem.

Let's make a short-cut into the education of this subject. For those courses I used some ideas from the magazine Chip.

Niccolo Machiavelli (1469-1527) was a politician, writer and philosopher from Firenze in Italy. One of his best known works is „The Ruler” (Il Principe). In this work, by the way, he wonders about union of Italy and about ways how to reach it. The term Machiavellianism which is used to express a sort of political behaving or, in wider meaning, unfair manipulation with people spreads out from his work.

The magazine Chip (see references) shows the ways how to manipulate with people on the basis of mathematics either in secret or public way on the highest political positions.

Let's have a look into the statistics, the science which has always been useful for a state. This is indicated in its name.

One old saying says that there are several kinds of lies - small lie, bigger lie, the biggest lie and statistics. In state there were columns of numbers which values were close to zero. Several figures and terms were introduced and a new mathematical branch was discovered - statistics. It is an exact science. It means that its results are considered to be irreversible and conclusive. Bear in mind that whatever made by man for his use, including statistics, is only a means. Means which can be use and misuse by those who know all their aspects and possibilities.

The most often used term in statistics is an average. Usually it is an arithmetical means. In this case everything depends on chosen statistic group. If the chosen set was represented by two people and one of them ate a whole chicken and the other one starved, then from the statistical point of view both citizens had half of a chicken. An average salary of railwaymen depends on the fact whether salaries of managers and members of ministry have been included. Recently I have read in a newspaper that average sa-

lary at universities is 16 000,- CZK. I do not know whose salaries belong to this statistical set. Does it include only teachers salaries or does it cover also administrative workers ?

Other known terms are median and modus and last but not least percentage. See example from the magazine Chip.

Imagine company XYZ. Its total amount of shares is 500 000. This amount is divided as follows: the majority owner has 378 900 shares. Ten smaller owners have 10 000 shares each. One hundred people own 100 shares each. One thousand members have 10 shares each and one thousand and hundred people got 1 share each in The Coupon Privatisation. We can truly say about the XYZ company that typical shareholder owns 10 shares (median), typical shareholder owns just one share (modus), more than 90 % of shareholders owns less than 20 shares. So more than 50 % of shareholders have less than 100 shares each, or that almost 95 % of shareholders owns up to 10 shares each. All depends just on the results we intend to reach. None from previously named declarations does not actually describe anything about the company participation structure, despite acting that way. The majority shareholder, managing the whole company was lost inbetween truthful and sharp information. Let's hold on to percentual implication. Did we reach a high inflation ? Let's abstract from deregulation of hire and electricity prices in the basement calculation and call it „the net inflation”. The result looks much more better this way.

Very often we are witness of increasing industrial production by 300 % (i.e. 4 times more compare to previous production) in comparison with 3 % in developed industrial countries. In fact the production increased by 300 when I am producing 4 cars instead of just 1 car, whilst production increases just by 3 % when current production is 103 cars instead of 100 cars. Nevertheless talking in percentual growth and forgetting the base is a traditional propaganda move. Similar manipulation happens today, see year 1994 when there had already been problems with financing the health care. Someone famous proclaimed on TV that the lack of money in health care was obvious because a number of hospitals increased about 900 % in comparison with year 1989. It means that a number of doctors and nurses increased 10 times but it is not true in fact. A number of nurses decreased. The reason was that regional health care centres were divided into smaller health centres. For example, all dentists in our town opened their private surgeries. The same house the same doctors ? Not exactly. There were less administrative workers but a number of surgeries increased. Another problem is an absolute number. It was stated that government would expand two milliards CZK in order to increase pensions. It sounds very positive but when you start to count that the two milliards

CZK should cover one million pensions multiplied by 12 months the final amount is 170,- CZK per person per month.

All those news sounds very good but you always have to think about them from various points of view.

Just one more example from newspaper: All offenders were sentenced to imprisonment for 115 years. The news does not inform us about number of offenders, how was the punishment divided, is the punishment strict or not. In fact, the news does not say anything but it gives impression of good work of our police.

At least let's talk about computers. Someone clever said: „Computer is a great thing. It helps me to do more quickly things that I would never do if I have no computer. There are two approaches to computer: absolute reliance upon computer's precision and that computer can be blamed for all mistakes. As statistics, a computer is only an instrument. It is only up to us, people, how and for what purpose we use it. A special term exists for wrong application - GIGA - from English „garbage in, garbage out”. We can often hear „It is stated in computer ...” but we do not admit „it is in us”.

In the new subject (Statistics) I do not concentrate only on education but also on upbringing. Only knowledge is worthless when it can be misused.

## References

- [1] Virius M.: *Machiavelli Would Envy*, Chip 11/98 (pp. 69-72)
- [2] Virius M.: *Machiavelli for Second Time*, Chip 12/98 (pp. 38-42)

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