

# Advanced tools for Visualizing, Measuring and Managing Intangibles

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## Introduction and problem description

In the last years it shows up propagated that the instruments of the economists do not have the desired precision. The author would like to point possibilities out with this paper, how with new aspects and instruments white marks of the economic map can be mapped and opened thereby.

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## As the economy expands itself and changes.

Since beginning of the manufacturers revolution in the 18. Jahrhundert the economy expanded from Low Tech conditions to High Tech conditions. That means in other words that the resources for the creation of wealth as the results are of less and less more tangible and more and more of intangible consistency. „More intelligent ones of “offers need now simply more grey subject.

### Development of economic assets

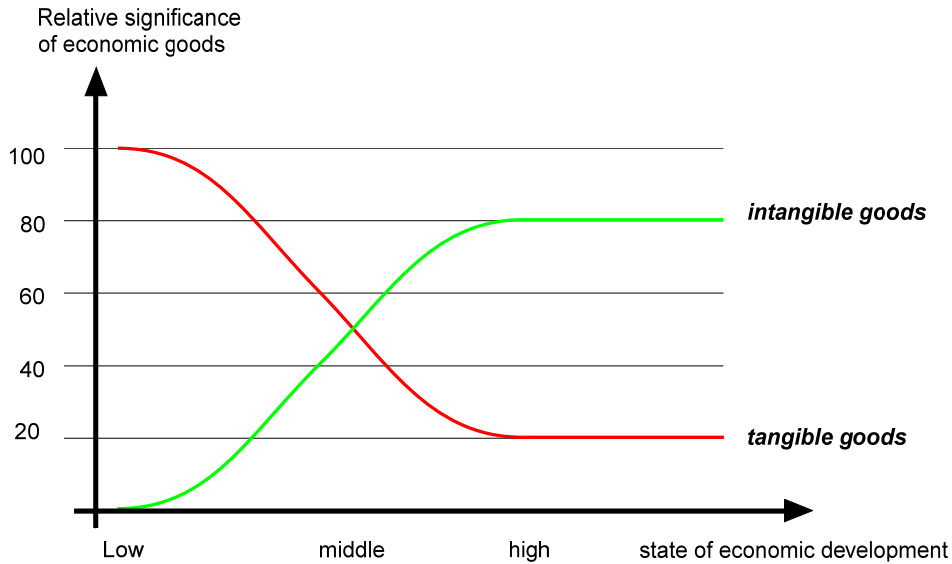


Figure 1

But the kind of the goods, also the form of the offers did not only change during the development of the Low to the High Tech economics. While in Low Tech areas humans still predominantly concern themselves with the supply of material products. This is replaced by service orientation and further on enhanced by license businesses.

### Development of Business Offerings

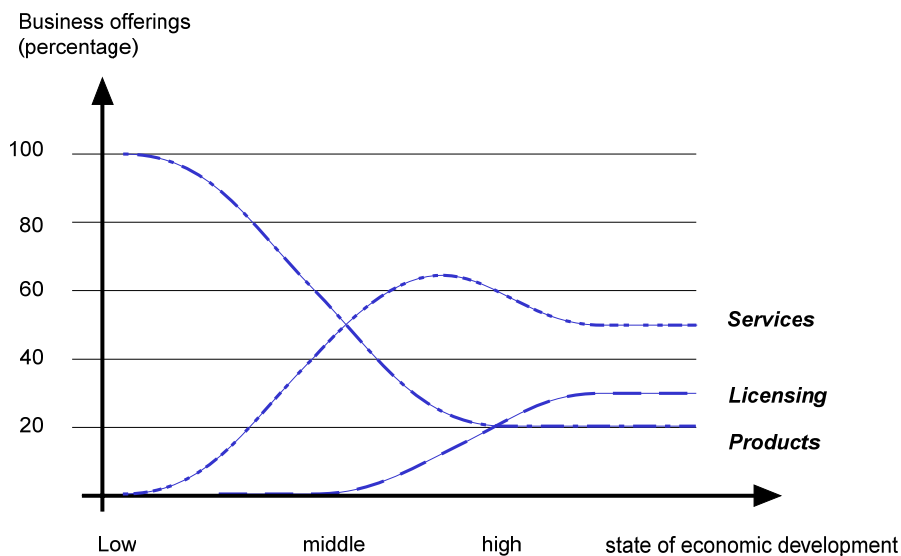


Figure 2

# Models, tools, products for the declaration of the economy

## The development of products

Outgoing from a need and a solution products normally expand themselves in curves, which exhibit one „S-form “. With a higher maturity of the solutions advancements can be only achieved at increasingly expenses, because the bases remain alike for solution. One says that solutions come into one „saturation “and that an advancement on the past bases no more is not worthwhile itself.

If thus certain solutions come into the saturation - or if they cannot be sufficient for changed requirements any longer - are ripe the time for a new solution. The product life cycle of the old solution leans to end and from a new generation is replaced.

Product life cycles can be for a very long time. The Volkswagen beetle was produced approximately 50 years. It was only then substituted by the Volkswagen Golf, which was in the meantime already several times revised.

Such S-curve developments can be found with all developments in the technological and also within the social range.

Peter F. Drucker gave public notice of for this in his book “Innovation”. In the fact it describes impressive that the cause for leap innovations refers to, thus the change of the red “distortion underground to the green reverse curve normally on one „. A distortion between what is and what should be.

## Economic theory as a product

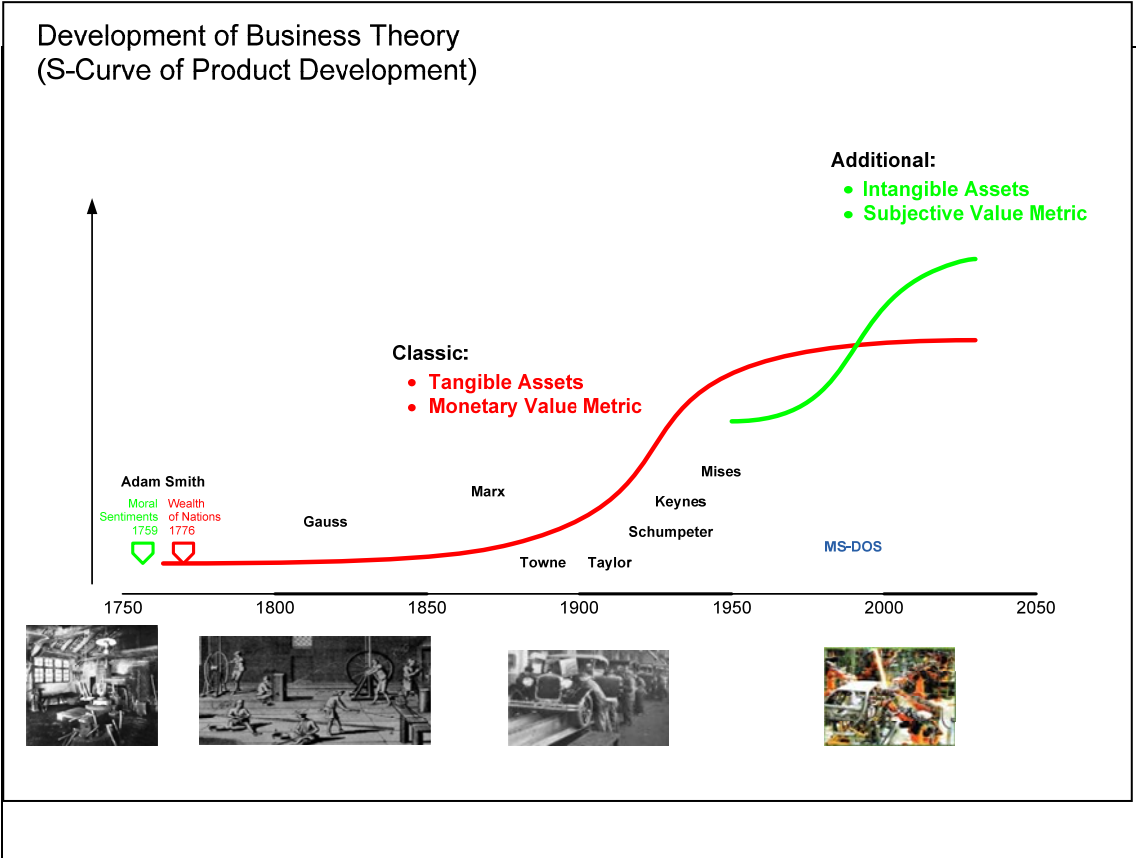


Figure 3

Economics take a special under all the teachings on position, because their statements have directly and indirectly effect on thinking and an acting of high-level personnel in politics and economics. The effect is direct because high-level personnel must acquire itself the restaurant knowledge, in order to understand and to communicate be able the connections better. The effect is indirect because in the course of the time six priority areas developed, in which individual aspects of the economy are worked on and adjusted by specialists.

With the six priorities it acts over:

1. The political economy, which has primarily „the well-being issue “of the nations as priorities;
2. The management economics, in which the considerations intensified is aligned to the enterprise;
3. The teachings to the management, as they would have to use the economic inspections in practice;
4. The accounting, in which together with the financial bookkeeping also an accounting department was expanded, which accounts the costs according to various criteria;
5. The juridical system, in which among other things one holds, under which conditions an enterprise is resolved and
6. the chartered accountants, who are consulted with larger enterprises for the examination of the deals.

Also in these priorities continuously adjustments take place. But there is in nearly all cases constant developments on the same bases. The development within these priority areas is affected naturally also a constant reverse curve.

There were and give new set ups for the declaration and organization it also. They their origin mostly in the area of conflict between teachings and their application in practice, thus in the priorities 3rd that such developments harmonically to run had, could in the last months are not very well tracing at all.

A special problem during the conversion of innovations with the declaration models for the economy lies in the fact that for „the scientific acknowledgment “,in principle “all six priorities should to give and if necessary their imported working processes to adapt have it to a new aspect „agreement “. This division of labor accelerates and does not facilitate a not straight brisk adjustment of the teachings originating from the craftsman age on the requirements of an after-industrial economy, in which rightfully humans with its immaterial potentials and its subjective value conceptions become ever more important.

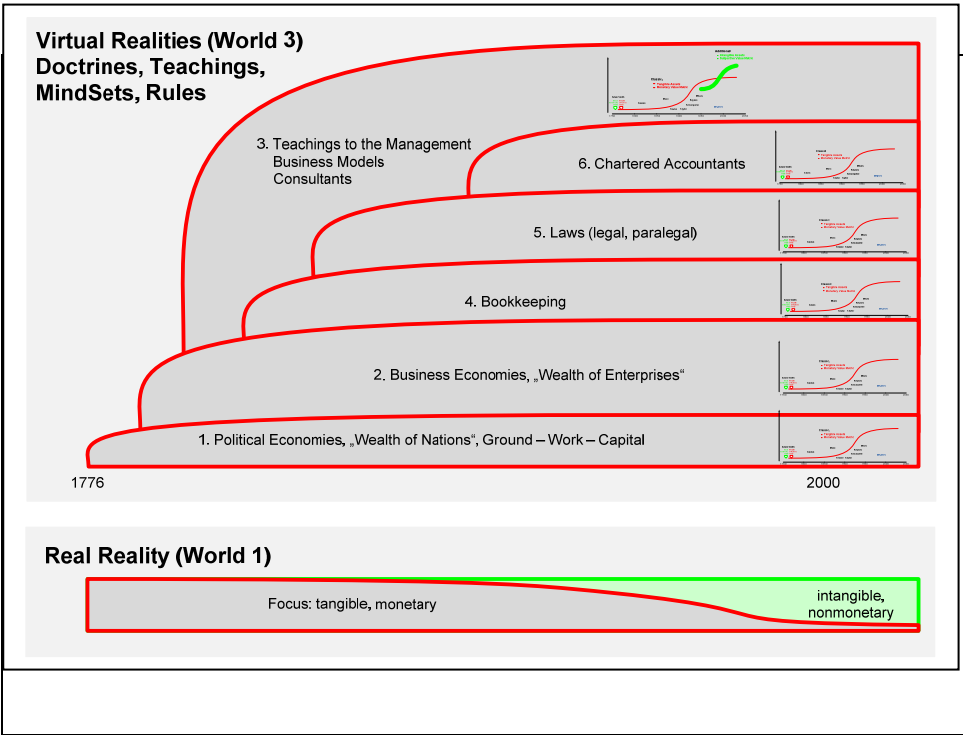


Figure 4

## Two overhauled paradigms

From the many postulates and acceptances in the classical economic theory „the developers at that time “of the models would probably specify two paradigms with highest priority again.

1. The paradigm „ground, work, capital “probably substituted by the organization of resources into tangible and intangible objects.
2. A further paradigm, i.e. the value paradigm, was likewise placed by the expansion of the linear monetary value thinking by a subjective value indicator on a new number base.

Both paradigm expansions are a condition for a restaurant model, which can correspond to the today's and future requirements better.

While the expansion of the first paradigm is understanding and brings no mathematical difficulties, the expansion of the monetary yardstick is already somewhat more difficult by a subjective value measure for experienced economists to accept. Many of them will probably go through all phases of a paradigm shift, which Thomas Kuhn in its book *The Structure of Scientific revolution* “1962 described.

On the part of mathematics the instruments are present around invoice on two dimensions. This both in the form of the complex numbers and by the use of vectors. Vectors and complex numbers made it possible in the history of the natural sciences already several times to improve insufficient illustration instruments and declaration models. For example to the scientifically accepted declaration of the alternating current, color, the force, the power...

The effects on the existing economic literature are “marginal in principle “. In the book „*Theory of Value*“ (1959, Gerard Debreu, Nobel laureate, Yale University press) for example specified on page 62 „The expenditure... must clearly be at most equal to the wealth of the customer, a real number.“. This restriction on a linear measuring system should be written new in the language of the mathematicians expressed: „The expenditure... must clearly be at most equal to the wealth of the customer, a complex number.“.

The effects on the organization of economics and company might be however large and positive.

### Objects, Attributes, Value-Measures

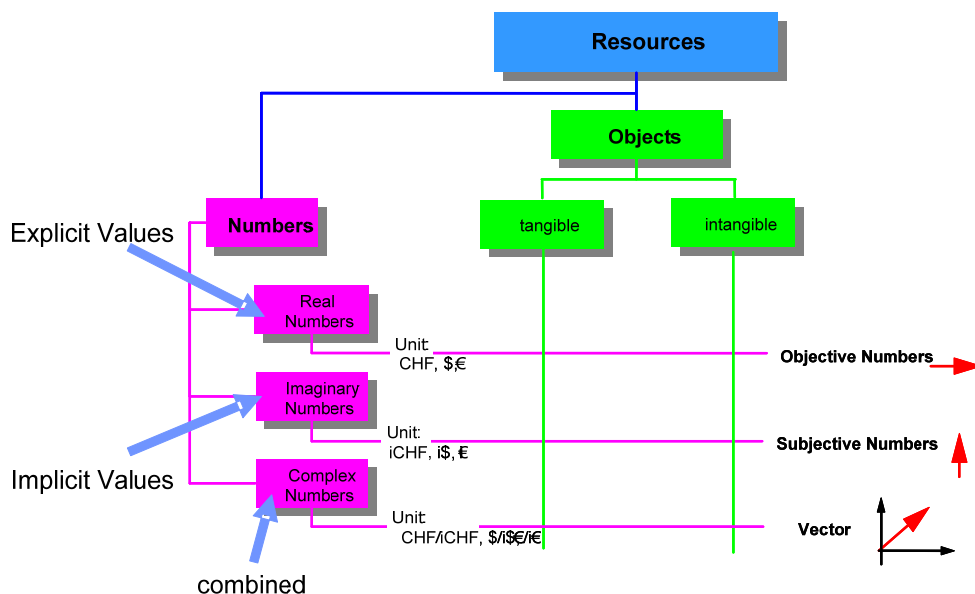


Figure 5

## The vector

The vector is a mathematical vehicle, with which itself in multidimensional spaces arithmetically - and, which lets actual invoice for our purposes particularly interesting also graphically. The possibilities of the value illustration by the vector are so various and in the range of the economics so unusual that some examples from its application are indicated in physics. Vectors are to be excluded from no more ranges, be considered in those physical dimension with two or more dimensions such as forces (strength and direction), speeds, accelerations, colors, temperatures in the construction and planning.

With vectors it is possible for 200 years in technology and (now) also in the economy to represent several value characteristics (monetary AND non-monetary, "objective" AND subjective) among themselves and at the same time. Straight one in the economics is important it to consider several value characteristics at the same time in decision making. The application of the vector offers for this unused possibilities over for itself to transparency to acquisition and the decisions also with others to divide.

More simply is in figure 6 represented.

## Single 2D-Vector

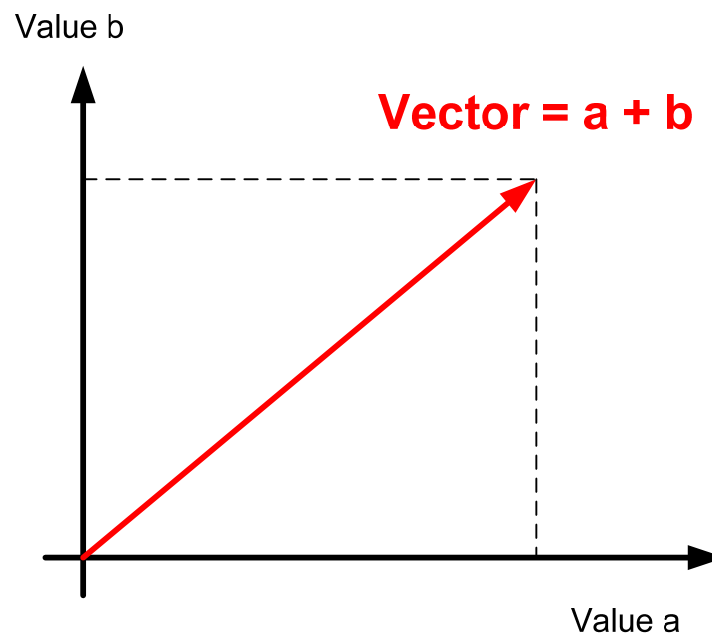


Figure 6

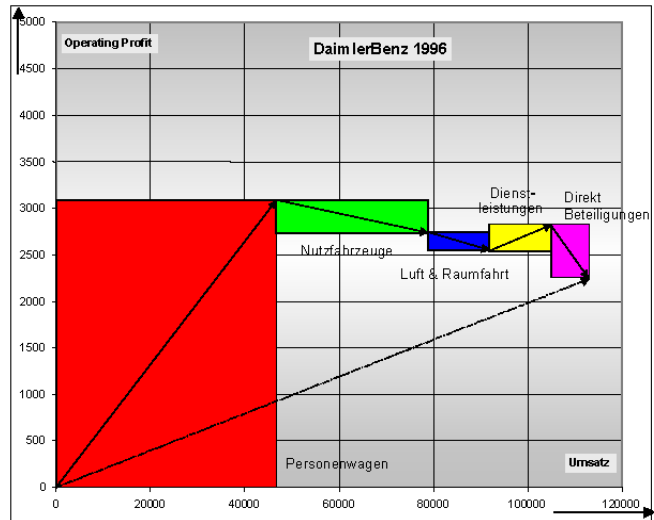
For the values „a “and „b “can be used arbitrary indicators and metrics. Examples: Turnover, profit, amount covered, development costs, disease days, storage space, turn-around time. The vector visualizes that the connections.

Somewhat more interesting in more informative the application of the vector, if one expects it graphically, is represented as in figure 7.

# DaimlerBenz 1996

(Quelle: DaimlerBenz Geschäftsbericht 1997)

Zahlen 1996	Umsatz	Operating Profit
Personenwagen	46652	3090
Nutzfahrzeuge	32152	-354
Luft & Raumfahrt	13053	-196
Dienstleistungen	13143	288
Direkt geführte Betel.	8014	-585
Element6	0	0
Element7	0	0
Element8	0	0
Element9	0	0
Element10	0	0
<b>Summe</b>	<b>113014</b>	<b>2243</b>



Die strichlierte Linie zeigt das durchschnittliche Verhältnis von "Operating Profit" zum "Umsatz".  
 Flachere Vektoren zeigen eine unterdurchschnittliche und steilere Vektoren eine überdurchschnittliche Performance.

Figure 7

The picture shows two characteristic numbers operating profit and conversion of Daimler Benz with the five business fields in the year 1996. Contrary to the usual numbers in the left field is immediately evident in the vector representation, which range contributed as much above average (or negatively) to business success. At the same time one loses not in the numbers but keeps themselves the overview of the substantial.

Figure 8 shows then that on the y axis also subjective value indicators give new explanations.

## Vector Aggregation and Drilldown Analysis (Example: Automotive R&D)

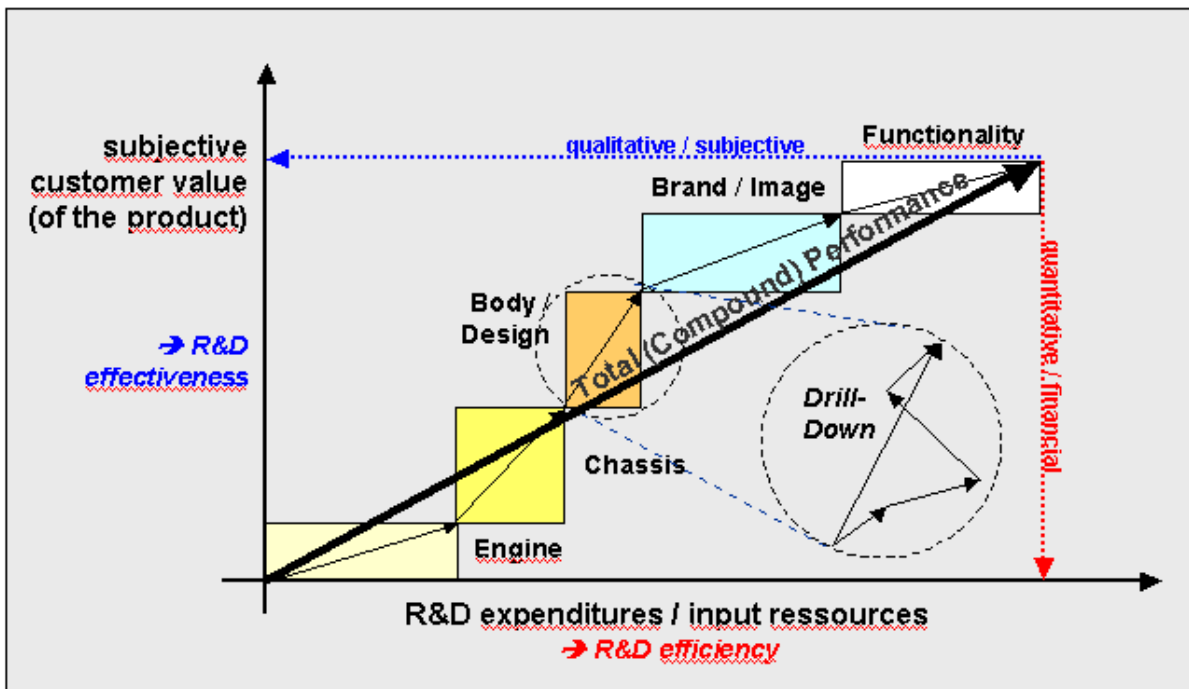


Figure 8

In addition, the introduction of the vector to the value illustration makes the proposal possible for a quantitative metric of subjective values.

In figure 9 is represented, as from two monetary indicators book price and stock exchange price of a share are specified, how large for this shareholder the subjective value of this share is. The example shows two shareholders, who are bent to finance divergent prices.

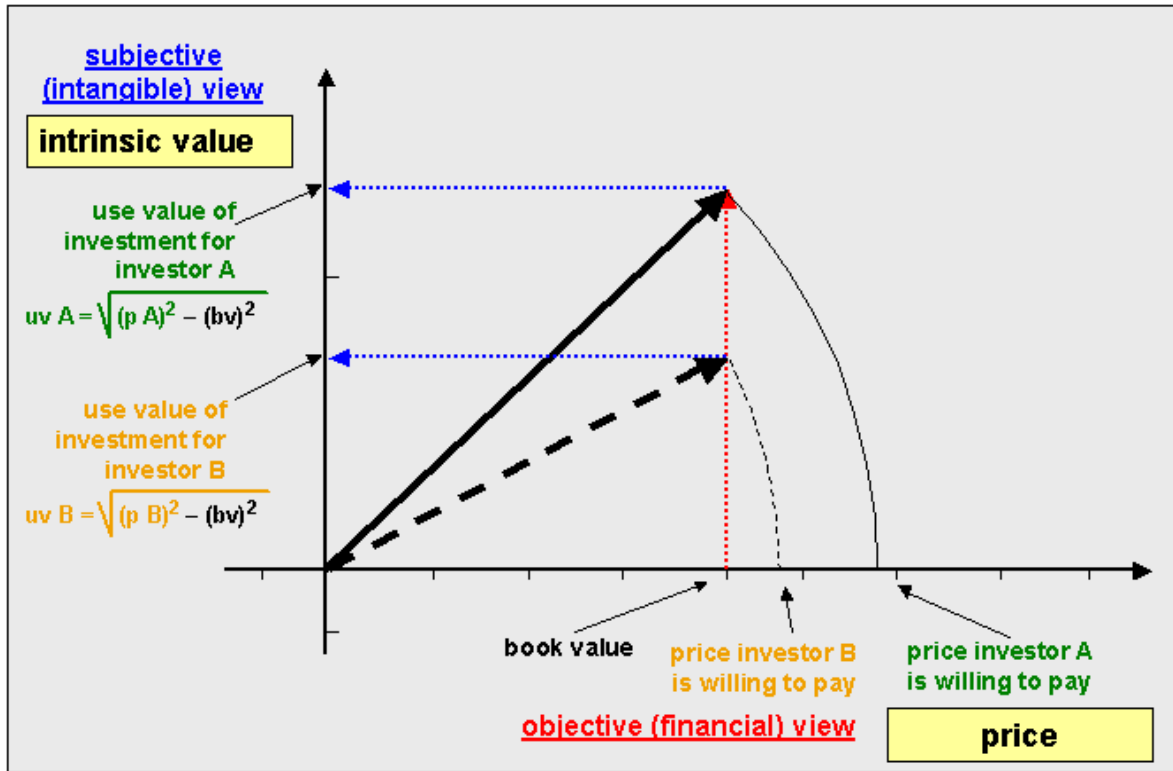


Figure 9

As already further above specified, those the examples of the application of the vector so variously that their enumerating would blow up the framework. In particular also, if one includes the range of the Behavioral Economics into the considerations.

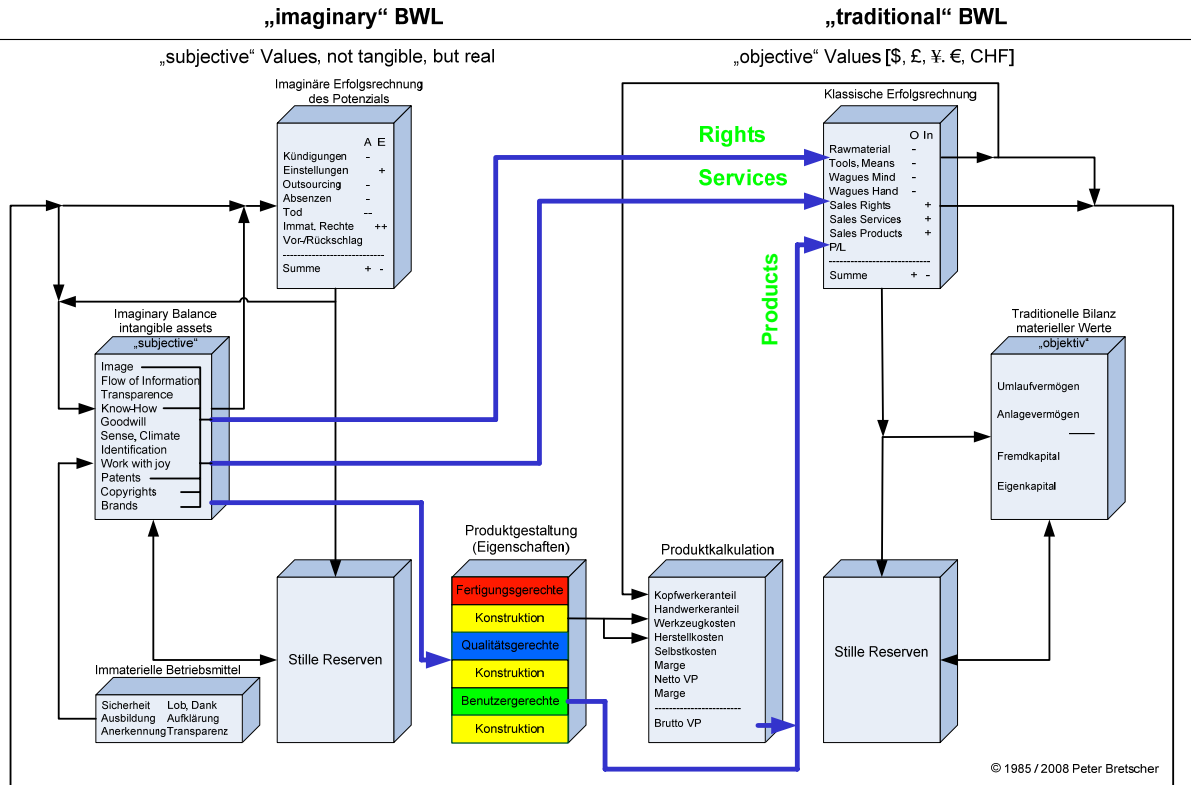
For interested people, who would like to intensify the concentrated representation in this paper, for resuming information a web page was furnished, from which further examples can be called up.

Link: <http://www.bengin.net/dresden/>

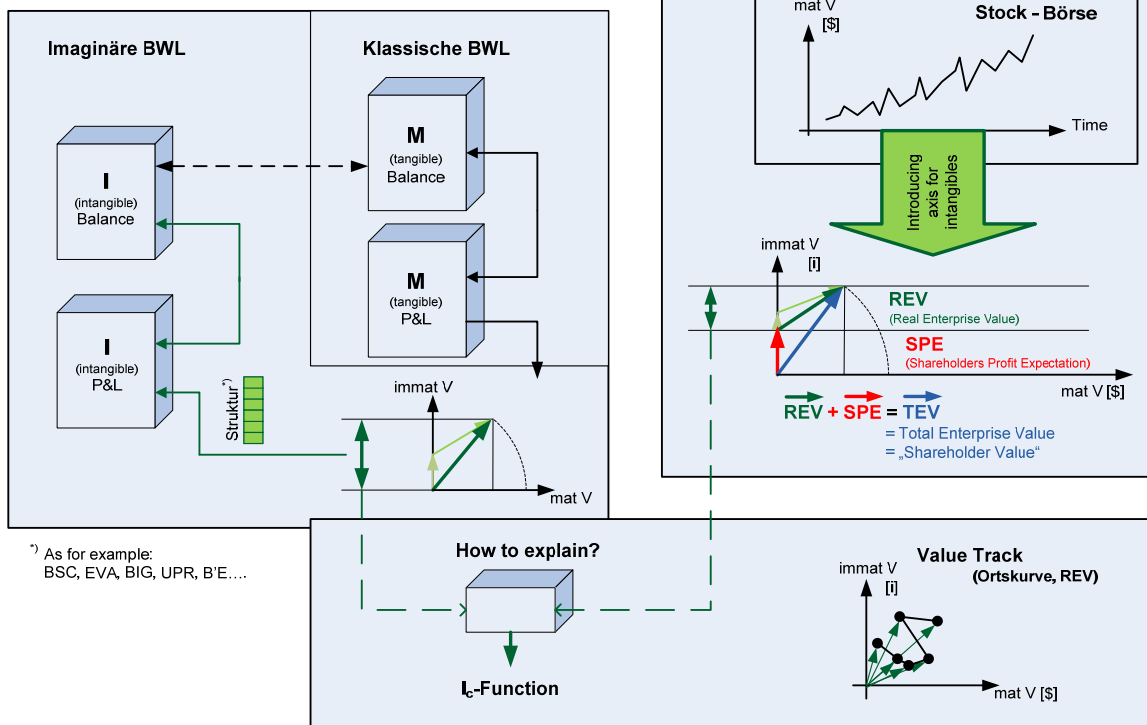


# Outlook

With the expansion of classical balance by an immaterial balance and the monetary value metric by subjective indicators the options for a lasting development of politics and economics rise substantially. What until now was missed is now on the map and will have a positive impact.



## Economic Value Architecture & Engineering



## Persons, organizations and literature

### Persons:

Dan Ariely: <http://web.mit.edu/ariely/www/MIT/>

Nassim Nicholas Taleb: <http://www.fooledbyrandomness.com/>

Gary Hamel: <http://www.garyhamel.com/>

Gunnar Heinsohn: [http://de.wikipedia.org/wiki/Gunnar\\_Heinsohn](http://de.wikipedia.org/wiki/Gunnar_Heinsohn)

Don Tapscott: [www.ngenera.com](http://www.ngenera.com)

### Organizations:

European Commission: Beyond Union of Police <http://www.beyond-gdp.eu>

### Resuming literature:

Adam Smith, 1759, Theory OF moral sentiment, <http://www.marxists.org/reference/archive/smith-adam/works/moral/index.htm>

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2009.02.23, [http://www.wired.com/techbiz/it/magazine/17-03/wp\\_quant](http://www.wired.com/techbiz/it/magazine/17-03/wp_quant)

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