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NO-BLE Ideas

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My-X team

i.e. an Innovative "Idea-Breeding-Farm"

(IBF, Idea-Breeding-Farm)

Jointly for our common future

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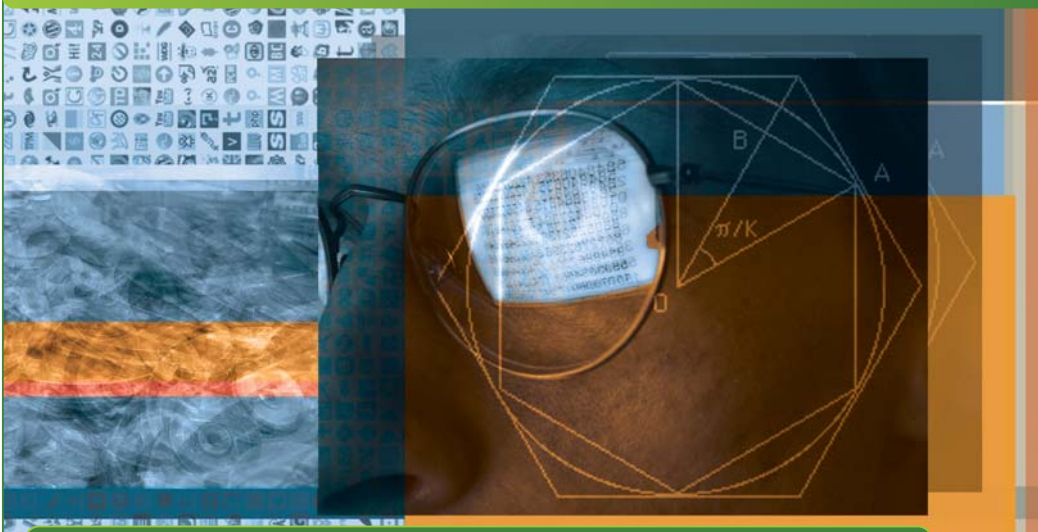

Introduction

My-X team was established in 2004 as the quasi successor of the ceased Department of Business Informatics on the University of Gödöllő. This period was an accidental coincidence with innovation potential measuring activities of Innovation Centre of Gödöllő (GIK) concerning higher education and since then My-X research team operates basically as one of the "idea-breeding-farm" of GIK and later the Regional Innovation Agency of Central-Hungary (INNOREG KM-RIÜ).

The base of becoming an idea-breeding-farm was given by a massive development series on the field of artificial intelligence and thinking methodology (it means the similarity analysis) which now has 25-year-old past and which can be proud of its international origin (cf. PhD-degree in Germany, 1993). The most important chronological steps are reviewed by the following chapter. In the next chapter, the similarity analysis will be embedded into the intellectual and cultural history. It is complemented by a brief review of the most important keywords and projects. And after all, as a summary a vision will be described, in order to mark out such a way for potential interested parties (partners, investors) - being worth using together.

So the aim of this document is to deliver a holistic review of the past decades based on provable incidences. Therefore, where it is possible, indicative URL-data are given itemized.

Historical Overview

In the framework of the historical overview, interested parties can measure how adventurous way led to the market success of several innovative recognition during the past 25 years.[1]

1986: The first experiment on the field of expert system development when the term was hardly known also at international level.

1990: The first thesis about the possibilities of rule-generator in prognostics which was made in itself after a German guest-semester.

1990-1993: In the framework of DAAD scholarship, development of novel artificial intelligences in order to support agricultural decisions - with successful defence to the end of the period in Germany. Free utilization of research results is absolute right of the originator.

1995-2004: In the framework of the adaptation of EU statistical system in case of the Hungarian agriculture several analyses were made deriving e exogenous variables of agricultural-sector models.

1996: Ownership in the first consulting company (Agroconsult Ltd.)

1997: STOCKNET[2]: Similarity analysis, as the know-how of My-X team was sold firstly apropos of stock exchange software-development.

1 cf. http://miau.gau.hu/miau/188/innovact_awards_2014_vrf/VRF_brochure.pdf
2 cf. http://miau.gau.hu/miau2009/index.php3?x=e0&string=stocknet

1998: MIAÚ[3] (HU ISSN 14191652). Electronic Journal of MIAU (Medium on Internet of Agricultural/Applied informatics in hUngary) started its operation in autumn of 1998 and since then it is the primary appearance scene of My-X team where daily actions of the research team can be followed itemized.[4]

2000: Company establishment to manage business projection of consultancy processes (CREW-PA Ltd.[5])

2001: ikTAbu (i.e. for the support for the Application of Information and Communication Technologies and Regional Development through of Data-Mining.) The second license-sale.[6]

2003: Appearance of the first COCO (component-based object comparison for objectivity) modules.[7]

2006: Successful Innocsekk tender - appearance of My-X denotation.[8]

2009: Factory-like operation of My-X analytic services

2009-2010: License-transmissions, establishment of spin-off companies (InnoHow Ltd., InnoSpin Ltd.[9])

2011-2014: Consecutive rural, region, economic development analyses[10]

2012: Winning ITBN Hungarian Innovation Award by the SeaLog solution of SeaCon Ltd. based on similarity analysis as know-how[11]

2012: FiTt, i.e. establishing the basis of Innovation Consulting Network for Higher Education[12]

2012-2014: RDI analyses[13]

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3 cf. http://miau.gau.hu
4 cf. http://miau.gau.hu/miau2009/index_tki.php3, ill. http://miau.gau.hu/myx-free/
5 cf. http://crew-pa.innohow.hu
6 cf. http://miau.gau.hu/iktabu/old/index.html
7 cf. http://miau.gau.hu/lps/
8 cf. http://miau.gau.hu/myx-free/
9 e.g. http://www.innohow.hu
10 e.g. http://miau.gau.hu/miau/dipo/
11 cf. http://www.itbn.hu/index.php/hu/itbn-biztonsagi-dij/2012-dijazottjai
12 cf. http://miau.gau.hu/miau2009/index.php3?x=e0&string=fitt
13 e.g. http://miau.gau.hu/miau/194/edigiregion.doc

2013: Analyzing ETDK-movement (ETDK means Scientific Student Conferences on university level) in the framework of the innovation consulting processes[14]

2013: Successful PhD-defence with similarity analysis aspects[15]

2013: INNOREG-KM-RIÜ special awards for the members of My-X research team in frame of the Scientific Student Conference (TDK)[16]

2013: Establishment of a new facultative subject titled Thinking-Methodology of which compulsory literature is a DVD containing a 20-hour-long presentation series (including keywords for highlighted scenes)[17]

2013: Several Noble Ideas Projects from My-X idea-breeding-farm[18]

2014: Innovact Award: participation in the Finale of international innovation competition in France with VRF project[19]

2014: SZIE Innovation Challenge-cup Applications[20]

2014: Researchers' Night, several human-experiments[21]

2014: HunInno/Innotrends: participation in the national Finale comprising 24 projects where NGSTRESS project inspired by My-X was awarded with one of the 6 given special prizes.

2014: Composition and publication of this document (ISBN 978-963-12-0943-3)

The entire process was seen through by dozens of TDKs (best student papers) and theses[22] from one of the most promising element was the NGSTRESS project.

14 cf. http://miau.gau.hu/miau/183/etdk2013_v3.doc
15 cf. https://szie.hu//file/tti/archivum/Bunkoczi_Laszlo_ertekezes.pdf
16 cf. http://miau.gau.hu/miau/183/Innovacios_kulondij.doc
17 cf. http://miau.gau.hu/myx-free/index.php3?x=dvd
18 cf. http://miau.gau.hu/miau2009/index.php3?x=e0&string=noble
19 cf. http://miau.gau.hu/miau2009/index.php3?x=e0&string=vrf
20 cf. http://miau.gau.hu/miau/190/vandordij
21 cf. http://miau.gau.hu/miau/193/human_experiments.doc
22 cf. http://miau.gau.hu/miau/188/SZIE_TDK_KMRIU_ONKOMM.xls

About Similarity Analysis

Similarity analysis is typically a product of the principle "being determines consciousness", where human intuition was forced into source code in order that momentary inflammation of people can be automated largely.

Motto: "*The world as we have created it is a process of our thinking. It cannot be changed without changing our thinking.*" (Albert Einstein)

Birth of Similarity Analysis

In the followings, the birth of similarity analysis is presented in order to ensure, that every interested party can find those connection points which help him personally before the more professional details to be able to (knowingly) merge with thus approach at a general level which involuntarily and continuously penetrates his decisions.
Apropos of the birth of similarity analysis, we try to avoid every foreign word with one exception: the "maiden name" of similarity analysis as it is "automated intuition-generation."
Intuition is an instinctive phenomenon; it does mean a non-voluntary feeling. Generation refers to the preparation, formation of something. Automation can be interpreted as mechanized repeated actions. So all together, similarity analysis is none other than the traction process of human insights generated by computer.

But why is this necessary? For giving the answer such life situations are traced from which one or other or more could be already experienced by anyone at anytime, which can be experienced by anytime:

- Let the first story be a fairy, but it will not be without any "bet": Once upon a time, somewhere in the Far East, there was a sultan and his five court-scientists. Once the sultan was bored so he prescribed a formula which was known only by him all over the world. The task of the court-scientists was to approximate the quint-essence of the formula as precisely as possible, if possible to find out the formula itself. For this the sultan let bring a bowl firstly on which one hundred same diamonds were to find. Every scientist could take from it a handful, and the last scientist should have swept the remained diamonds in his palm, if there were given any pieces at all. After that every scientist had to numerate "his" diamonds and should have said this number to the sultan: at first always the oldest and finally the youngest scientist could declare the number of "his" diamonds (0, …, 100). Of course the amount of these numbers said by the scientist should lead exactly to one hundred, as they had to distribute the diamonds fully among each other. The sultan owing the five number, based on the formula which he found out and which was known only by him (e.g.. y=x6=x1+x2*x3/x4-x5) calculated a sixth number, i.e. the result of the mysterious formula. And he let be carved this last number into a big stone table next to the five numbers. They repeated this game for e.g. twenty times. So in the stone table number were in twenty lines and in 5+1 columns. Then the five scientists had to distribute among each other the one hundred diamonds in such a way that the 21th answer-value which the sultan was calculating exceeds the biggest number which was said by the sultan so far. If the requested distribution was not successful then the scientists failed, as experts. The task was collective, i.e. it was not possible that somebody's approach is better than the others' - the scientists should have agreed on one solution. If the solution was successful, the scientist could keep the hundred diamonds, if not, they had to die the next day. Question: Would you be able to take the scientists' role, if you can choose? Or do you judge the risk too big? Please, do not forget that every decision-maker (i.e. we altogether) plays continuously **SIMILAR** play in every decision-making, as we try to estimate the situation based on previous real (experienced) or taken/heard experiences, what should we do there at that time?
- The second story is a theatrical performance, and let it be playing nowadays. First scene: summer school camp, a causal catering-leader haphazardly buys a lot of things for the children's rewarding apropos of competitive games. He buys inter alia muesli bars, too. From the many options he chooses the blue-wrapped ones

because at the same time the camp-flag is also blue. Conflict: some "zippy" parents haul up for, in this case for the irrational price-performance relation of muesli bars (i.e. for that how better product could have been bought e.g. at a slightly expensive level), and the parents accuse the catering-leader that he received commission from certain deliverers and this was the reason why he only bought the blue-wrapped muesli bars. The meritorious but unprepared catering-leader cannot able to clarify him from the untrue attacks, accusations. He leaves the stage as a fallen man. Second scene: the broken (but willing to learn from the previous experiences) catering-leader, who now understands the essence of similarity analysis, comes on the scene again. Conflict: new school, new camp, and after a well-prepared buying, some "not solid" parents start to accuse again on open ground. Third scene: ahead of the Court - action for libel, the catering-leader wins, of course he spends the received compensation for the children…happy-end…But what did happen after the first scene? Every Hungarian could hear this wise proverb: "Cheap meat produces thin broth!" This proverb is wise but it is instinctual, using today's word: the tabloid-suspicious, sensation-hungry anecdote world and oral tradition mediate incorrectly the point: it is not done than a sentence ends to exclamation mark. The correct folk wisdom: Only carefully, only carefully: cheap meat may sometimes produce thin broth… And really, something can be (e.g. a portion of meat) so bad (well, not edible, does not mean a hook for consumer protectors), but fatty, wet, old, lost its colour, formless, etc. that this prize what is asking for it not little enough compared to those "performance-shortage", which can be catch out apropos of the certain portion of meat. Only those are able to shed light on it, who take a look to difference products, who examine those and COMPARE.

- The third story guides us to the world of demagogies: it should be assumed, in a newspaper an article was published about for example that "Steppe-Land" is at the last rank among the world's countries regarding its environmental expenditures per capita, vis-a-vis for example "Robotia" where a lot of money is expended for environmental protection. Poor people from Steppe-Land could walk from now with their head down in the world if they were not be spirited and if they could not be able so to say pass in the revolving door, too. As journalists and scientists of Steppe-Land published a news against the previous mentioned articles since the world's countries have been COMPARED using data series of UNO, and calculated that in certain life situation how much the correct amount is which should be spent to environmental protection considering the other country-indicators. And wonders of wonders in Steppe-Land, where the wind blows softly, the air has fresh flower fragrance and where industry, population is not much and where ancestors have already solved water regulation the statistically detected environmental expenditures per capita exceeds quasi with 10% that level, which could have been taken by others in their place. As in the case of Robotia (the muddy citadel of industry) turned out that if they spend quasi twice as much as nowadays, maybe we can talk about such environmental condition, as in the case of Steppe-Land.
- The fourth story must be disconnected from enmity's vocabulary of well-known religious, nationality, ethnical and other perspective and must be put into sci-fi ambiance: Under the fable of sacrificial lamb:
    0. let's imagine a community which has to sacrifice one of its members at every single time for the propitiation of an external force (e.g. an invincible dragon),
    1. the community is democratic, i.e. articulated to factions, trends,
    2. the community already knows, that quantity does not change into quality in every case, i.e. the majority does not have to understand more about the world obligatory, as its smartest individuals,

3. so in the community there is freedom of thought, belief and opinion, and the alternative opinions and not these representatives "rival" with each other,
4. the community tries to have compromised solutions,
5. every member of the community is well-educated methodologically, knows e.g. similarity analysis,
6. some members of the community can have contrary opinion,
7. every faction argue methodically, based on facts every time
8. the result of every argue system is the rank of community's members in the viewpoint of expendability
9. ranking values of factions pro person can be significantly different according to each other,
10. in the case of contrary opinions there can be valid and invalid ranking values,
11. during the compromised search every opinion has the same weigh at the initial, but credibility should be maximized,
12. that person will be sacrificed without any discussion, who is mostly in line with every interest-sphere/philosophy's force field taking into consideration every factor
13. who would like to live in this community?

+1: if there is a two-thirds majority at the closing voting for not to sacrifice the final applicant, then the "game" starts afresh, now without the exempt.

In the story above the fabulous community is looking for the answer in case of the question, if based on every aspects, some indicators come to anyone's mind, which citizen fits mostly, i.e. in the competition carried on with the others, to the ideal expendable or non-expendable? According to the emerged viewpoints every faction can believe on different evaluations: there can be ones who state, more a person like this, more expendable he is, or vice versa. Every tendency should create its (set it consistently by itself) "black-list" at any given time, and should share it. It is not enough to drop principle, principle-fraction to the public awareness. COMPARED the black-lists the community has to make a final decision, otherwise the evil empire will decimate them. Who will be the sacrificial lamb? What is that method in which you can believe e.g. without civil war through generations? Is there sustainability in the war of priorities? Can have everybody differently the same evaluation? Or only the drawing lot is ethical?

National and International History of Similarity Analysis

In this chapter, following the well-known logic of canonized disciplines, it should be presented how the fable- and anecdote-like fundamental concepts recognized in the introduction developed in the world and in Hungary in the distant past to nowadays.[23] This challenge is "The Never-ending Story" itself (cf. by Michael Ende), and that is not that, it will be foreseeable quickly and simply:
Aside from a serious linguistic verification it is likely to be stated calmly that the most ancient, given instinctively, every time available thought of human race is (was) the fundamental concept of similarity.
In this way instinctive analysis of similarity, i.e. the intuition itself the primary control principle of every people, group and society at every time, even if it is cannot be caught out with the same frequency in written monuments.

Assignment of life situations missed from the introduction without sorting and effort to be completeness states here as "proof" that mankind continuously was aware and be aware that we should and it is possible to think in "sustainable ratios":

- biblical approach: contest of man happens by his merits:[24]
  Psalms 62:13 – "And mercy, O Lord, is yours, for you give to every man the reward of his work."
  Sir 17:23 – "Afterward he will arise and requite them, and he will bring their recompense on their heads."
  Iz 59:18 – "According to their deeds, accordingly he will repay, fury to his adversaries, recompence to his enemies; to the islands he will repay recompence."
  Jer 32:19 – "Great in counsel, and mighty in work: for thine eyes are open upon all the ways of the sons of men: to give every one according to his ways, and according to the fruit of his doings"
- Buddhist's approach: final event of man happens by his merits
  (cf.[25] "in his next life he will have better life by his merits"),
- Islamism's approach: final event of man happens by his merits
  (cf.[26] "ahead of Allah in the ratio of good and bad deeds he has the final test, and he receives foretaste of Hell or Paradise by his merits"),

[23] cf. http://hu.wikipedia.org/wiki/Hasonl%C3%B3s%C3%A1gelemz%C3%A9s
[24] cf. http://www.kereszteny.hu/biblia/showtrans.php?reftrans=1
[25] cf. http://www.libri.hu/konyv/buddhista-regek-es-mondak.html
[26] cf. http://www.harmonet.hu/cikk_nyomtat.php?Harmonet&cikkid=13757

- communistic approach: everyone according to his merits (cf.[27] "everyone according to his own abilities, everyone according to his own needs" Marx: The Critique of the Gotha Program),
- educational-didactical approach: we can require learning achievement with respect of his own abilities (cf.[28] System of teaching-learning: Workers of the school require order, discipline and cleanliness from students of Bocskai and require learning and achievement from everybody based on their own abilities),
- law and justice: principle of proportional penalty (cf.:[29] Penalties applied in certain cases should be in proportion with the committed crime (proportional penalty, requirement of justice),
- public burdens: everyone should take out his own part according to his possibilities from the wearing of social burdens
- public procurement: procurement of required products/services in form of the best price/performance conditions
- principle of golden ratio: i.e. mathematics of beauty

As it is well-seen, the conceptual declaration of being always as proportional as possible pervades basis of human society indeed. Of course there are also phenomenon operate without the principle of proportion:

27 cf. http://hirmagazin.sulinet.hu/hu/oktatas/ideologiak-marxizmus
28 cf. http://www.bocskai11.hu/index.php?id=leendo_elsosoknek
29 cf. http://www.fovarositorvenyszek.hu/sites/default/files/allomanyok/szellemimuhely/gondolatok.pdf

Not similarity-based (not proportion-based) approaches in the world:

- love does not turn out, the more you give the more it will be,
- if you share your knowledge with other, you will not be less only the world will be more meaningful around you,
- "hat with smoke-filter" effect: never mind what you do, you can only come to grief,
- Pygmalion-effect: over-lapping/conjuction of causes and reasons

Beyond theoretical recognition of proportion's importance, the history of ideas basically shows off naive folklore solutions for the vulgar explanation of n-dimensional evaluations:

- linear and inverse relationship: gives meaning only among two phenomenon,
- indexes, specific indicators/index numbers, indicators basically express the ratio of two factors (e.g. an attribute per capita),
- ranking lists working out several viewpoints (e.g. hierarchy of higher education institutions) are the system of such un-validated, instinctive, interest-driven weighting and scoring (cf. potential-star-method or potential-analysis30) which result/message reflects the self-conscious or senseless message of senders,
- clustering methodologically is the enforcement of such mathematical apparatus which as conceptions are closed, logical but their relationship to reality is given by explanatory, empathy and intuitive ability of the researcher.

In case of specific indicators, the suggestion is also true whether it should not be that the income per capita, expenditures per capita etc. be lower or higher according to (social-economic, ecological) framework conditions.

Based on the theories (like being determines consciousness) and with focusing on the phenomenon of sustainability, the cybernetic rule of law is constrained to be able to create computer programs realizing the ancient proportional principles. Similarity analysis (intuition-generation) is an intuitive answer born to this urge, i.e. trapping of intuition by intuition is to facilitate biological instinct by computer simulation.

30 cf. http://miau.gau.hu/miau/remete/pcsm.html

Basic Concepts of Similarity Analysis

In this case introduction of basic keywords does not mean classical (e.g. mathematical) definition-making, much more a kind of brief, suggestive characterization of important phenomenon in alphabetical order:

- **abduction:** Next to deduction and induction it is a third inference method. Currently it is not programmed, cannot be bought in software-form, i.e. it is exist but it is a human abilities which has not been explored in its whole depth.[31]
- **anti-discrimination calculation:** Such an optimizing procedure which aim is to be able to supply objects described with many attributes leading to the same consequence in case of each objects as the result of the calculation. It is the mathematical fulfilment of the principle of every(body) is differently same. In the framework of similarity analysis this is the Y0-MIN model where "min" means that the aim of optimization is to minimize aggregate of anomalies from constant dependent variable (Y0) in case of estimation and fictional facts for every objects (against the Y0-MAX analysis in which the aim is to generate the biggest fact-estimate difference as possible, i.e. the classical discrimination, clustering, classification).
- **attribute** (variable, index-number, indicator, component, parameter): One property of objects having a given (basically measurable, observable) unit of measurement which representation scale can also be nominal scale (e.g. colours).
- **benchmarking:** Comparison which means rather a thinking-method than an algorithm, so benchmarking is a kind of umbrella concept of comparative methodologies.[32]
- **CBR** (case-based reasoning): Umbrella concept of comparative methods/methodologies.[33]
- **COCO** (component-based object comparison for objectivity): English name of the online algorithm-family doing similarity analyses.
- **COCO_MCM** (Monte-Carlo Method): This is that module of COCO-based similarity analysis in which framework there is not any restrictive condition given in connection with optimization, i.e. where the form of connection between a given input and the given output can be arbitrary (e.g. polynomial) designed, aiming the largest explanatory power between level of input-attributes and outputs (for example in the case of that question: how do nutritional components of nutrients effect on expected lifetime at all?).

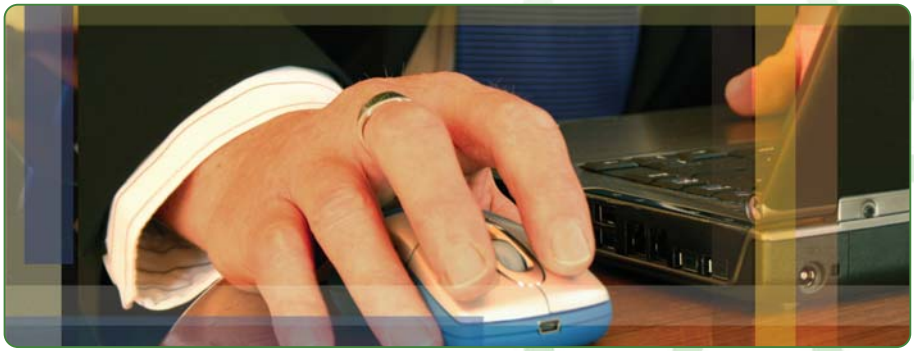
31 cf. http://miau.gau.hu/mediawiki/index.php/Abdukci%C3%B3
32 cf. http://miau.gau.hu/mediawiki/index.php/Benchmarking
33 cf. http://en.wikipedia.org/wiki/Case-based_reasoning

- **COCO_STD** (standard): Standard model of COCO-based similarity analysis in which framework there should be a real Y-variable (e.g. price) which is set up as the step function of X-variables with approximate aspect in accordance with the component-based logic of similarity analysis (e.g. price/performance analysis).
- **COCO_STEP:** Inside the COCO-based similarity analyses it is the name of a module-group by itself where the aim is to develop logical chains of more similarity analysis models beside the continuously verification of module-results' consistence (e.g. STEP IX module is able to derive a kind of secondary risk component according to a primary price/performance model having no errors. The secondary risk means an interval (min-max) about an already checked price, where this price could have been interpreted without causing incoherence problems in the whole price/performance-structure).
- **COCO_SWOT** (strengths, weaknesses, opportunities, threats): One of the newest member of COCO_STEP family which aim is to explore how does the whole pheno-menon-system move according to direction-logic of Y0 (ideal searching) model in the case of fixing applied direction of Y0 model, if every X(i) once turns into Y to check explanatory power of remained variables. It is the automated method of classical SWOT analysis and parallel a counterpoint of production function principle, where every X-Y relation (e.g. direction-parameter) should be based on experimental conclusions if ever possible.
- **COCO_Y0:** Another marking of anti-discrimination calculations, alias ideal searching model where in case of every X after the giving of direction effecting towards ideality that object is searching which mostly differs from the average in the frame-work of optimization so that the aim of optimization is all along to compel identity of objects.

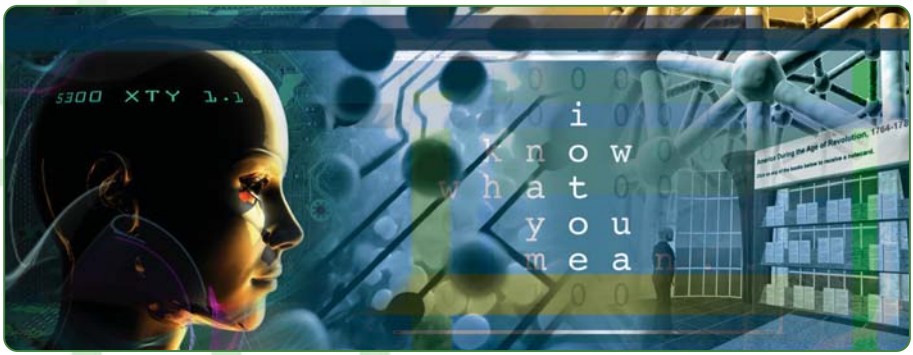
- **simultaneity models:** If there is no substantive temporal difference between Y and X(i) befallen at the least in time, i.e. dependent variable arise basically with at least one explanatory/independent variable at the same time then we talk about simultaneity models. Typical example for it the all anti-discrimination model where Y (ideality/risk/suspicion index) actually does not have time dimension. Next to it every model belongs there which makes SWOT analysis by same e.g. in year given object describing data. Bubble-models (e.g. price/exchange rate-bubble) are also such models, as they examine co-movement of prices or exchange rates from period to period. Bubble-models, and SWOT-model which are able to explore lacks of equilibriums have forecasting character (but not to give a concrete occurrence date), in case it is probably that deformities/bubbles should move toward balance sooner or later.
- **forecasts:** Against simultaneity models the classical forecast models are where Y befalls with any temporal gap according to X(i) becomes known at last. In this case when horizon of forecasts is that horizon which will pass between the last X(i) and Y. Availability of model calculations is attached formally to the formation moment of last occurred X(i), as time need of calculations is symbolic. Test of forecast model concerns whether around the forecast's horizon the requested (modelled) change comes true with great probability.
- **sustainability:** That philosophic-level presumption of similarity analysis according to which every system should move towards the minimization of difference between norm and fact, if it aspires after durable subsistence. This process can be conscious or spontaneous depending on the system.

- **suspicion generating:** The concept of suspicion none other than the synonym of estimation error. Everything is suspicious which cannot be explained by the available data. Of course in case of sufficiently many explanatory factors and beside relatively few numbers of cases almost everything can be explained fully. Although it should be true that model errors occur in lack of appropriate inputs, yet, voluminous fact-estimation differences have information-value. Suspicious in case of anti-discrimination models is that estimation error which cannot be reduced in any way as beyond variables taken into consideration the modelling person cannot and do not willing to take into account other manipulative factors. In this way suspicions in these models are violations of "every(body) is differently same" principle.
- **similarity:** From among many object in case of any three, similarity is the degree that which two of the three are state closer to each other as compared to the third.
- **similarity analysis:** The process of similarities' exploration which converts any single manipulative factor into hierarchy (ranking values, stair), then it defines from every level (stair) of each indicators in the framework of optimum-calculation how many unit should certain stair contribute to the consequence-variable's value per objects next to the conduction/aggregation of substation value of valid attribute's ranking values by given method (e.g. additive, multiplicative, hybridized).
- **heuristic:** Simplified (demagogic, naive folkloric, intuitive, charismatic) fulfilment of more factors' contraction into an integrated force field (e.g. object-similarity relies on weights and scores, like potential-star method).
- **induction:** Automated process of expert systems' formation in which e.g. the recognized rule-system is developed in the framework of similarity analysis. Basis of the rule-system is the number and effect of options qualified appreciable per attributes, i.e. the determination of combinatory space (cf. step function) next to given aggregation logic.
- **intuition:** Maturating the interaction of several factor into realistic model with respect to given factor via biological way in the human brain (and in arbitrary lower-level creatures).
- **inverse-formations:** One of the automated methodological layer of similarity analysis' self-checking mechanisms which compares results of converse (classified by reverse directions) learning models, i.e. we look for symmetry-deformities between reflections. (The winner of beauty contest should be the looser of ugliness contest).
- **direction vectors:** Determination of ceteris paribus connection form between object-description attributes (Xi) and the consequence-variable (Y) being compared together during similarity analysis which can e.g. follow linear relationship, inverse relationship, optimum-oriented, monotonous connection, ect.

- **consistence:** One of the methodological layer of similarity analysis' self-checking mechanisms which refers to required orderliness in the case of same problem/model searching in connection with the comparison of parallel models which can be mentioned in logical relationship with each other. Consistence formation can be arbitrary diverse. There is not formally totally consistence (without any contradiction) result but there can be such a few consistence-model layer which results do not "knock" each other. Consistence-based model evaluation attempts to resolve thesis of aimlessness: as according to the thesis of aimlessness it is not known when the learning process should be stopped, because if we know how do certain variable-set could explain from the value of consequence-variables, i.e. how does the expected error is, then there should not need to model where the answer of the above mentioned question is expected from the model. Thesis of aimlessness refers to the nonsense nature of search-oriented modelling. If it is not known where the learning process should be stopped, then it is not certain that model having minor errors is the better. Namely over-learning can be drawn up. In addition not only one error definition can be used as an aim (cf. numerical error thesis of minimal squares, contingency-coefficient, absolute error etc.).
- **step function:** Parameter-block should be defined in the framework of similarity analysis where each stair-level (ranking value) in case of each variable will be (with or without using directions) replaced through values being able to rebuilt the values of the dependent variable pro object and parallel minimize the aggregated errors of estimations during the optimization process.
- **LP:** The abbreviation of linear programming. The simplest engine of step function's determination where the optimization's aim is to minimize/maximize the error., Restrictions are the regulations regarding steps (e.g. more prominent ranking value does not reach less than a weaker ranking value). The solution (the block of altering cells) is the matrix of stairs.



- **nominal scale:** From the viewpoint of similarity analysis it is a scale of non-guided attributes, i.e. logic (e.g. colours without any direction) with which we could describe individual inputs which cannot be connected to each other in lesser/bigger relation (for building ranking values).
- **norm:** Synonym of estimation in similarity analysis. Norm is the output of optimization problems described by the model. A normative value per objects is the expected value, which should be given if the impacts of each available input are involved into the model.
- **OAM:** Object-attribute-matrix, i.e. in other words learning pattern in which now traditionally lines are the objects (cases), columns are their parameters (attributes, variables etc.).
- **object:** Denomination of comparative phenomenon: persons, subjects, processes, concepts, enterprises, countries etc. Objects can be frequented along the time relation of listed phenomenon (e.g. countries-year dimensions).
- **self-monitoring:** In case of similarity analysis self-monitoring/self-restraint is such a mathematical expectation-system which search for mechanism able to explore its contradiction aside the mathematical logic which gives basis of the process (e.g. symmetry-distortions of reflections, layered consistence-analysis).
- **ranking-scale:** Standardized view of primer input data during similarity analysis where every input defined in its own unit of measure inside its own attribute is replaced with that ranking value which correspond to the logic of attribute's typical direction (i.e. the fastest is the first, the slowest is the first).
- **expert systems:** System of option-variations and consequences exists in combinatorial space describe by the step function of similarity analysis which is able to give automatically the consequence belongs to option-variations recognized as an autonomous one in the framework of dialogue for the questioner.



- **simulation:** The utilization of automatically (similarity-driven) derived (inductive) expert systems in which framework it intends to explore the impact to consequence-variable made by the modification of the user's given situation (option variation) based on the model (e.g. it can be recognized in the framework of price-simulation which attribute change how take effect on the price of the object in the market).
- **learning pattern:** Basic unit of case-based reasoning is that objects/cases can be describe by the attributes. So object-attribute-matrix is a learning pattern in which apropos of every case volume of independent/explanatory variables and just examined dependant/consequence-variable are also known. In the learning pattern of similarity analysis explanatory variables have ranking values. Consequence-variable can keep its own unit of measure.

- **fact-based term-creation:** If the aim is the mathematical reconstruction of a lingual elements (terms), then terms which should be interpreted is represented by a fictive variable (Y) in frame of the similarity analysis. In case of every single X(i) the modelling person should give the direction of attributes. N-dimensional fact-based term-creation is none other than mathematization of platonic idea: e.g. the description of ideal desk, or employee. The anti-discrimination calculation searches for how every object can be evenly ideal. Suspicious-generation supposes that at the interpretation of fact-norm differences arisen next to the compliance of anti-discrimination principles it is allowed to interpret distance from ideality as risk.
- **data-driven policy making:** according to philosophy of similarity analysis before every single pronounced word, pronounced judgments every connected fact data should be validated in the framework of self-monitoring based on similarity analysis models. At the exploration of self-monitoring anomalies similarity analysis not only able to confirm or reject some hypothesis, but it is able to listen in a self-restricted way through the recognition of necessity of an "I do not know" system-answer.

Mathematical Backgrounds of Similarity Analysis

As previously presented and as there an unexplained relation in coherence of terms with each other so far, let's follows that operation sequence which can be vivified by a half-dozen formula in a spreadsheet calculation software. This steps are educated successfully for thousands of students at philosophic and/or technological level, these are totally public and can be considered further by anyone as the result. So we can say that we can set up a similarity analysis at anytime, anywhere within a few minutes.

0. The formulating of analytical problem should be fixed in the form of a question as far as possible.
1. Objects (cases) and their descriptive specifications (attributes, characteristics, indices, indicators, ect.) should be defined based on terms and synonyms in their associative relations included in the framework of the question.
2. Dividing terms into one consequence- and a lot of explanatory variables.
3. Giving the nature of ceteris paribus relation among dependent and independent variables with direction vector.
4. Creating OAM where lines are cases/objects, columns are attributes but only those for which an appropriate direction can be defined satisfying the model's logic.
5. Hiding unit of measures of primer object-attribute-matrix according to the directions with ranking values made per attributes (with RANK-function).
6. Introducing step function which formally is a table: its lines are the ranking values; its columns are the independent variables. Steps' unit of measure is inherited from the independent variables' unit of measure.
7. Giving restrictions regarding steps: i.e. the better ranking value should have higher parameter than in case of a less advantageous one (c.f. DEDUCTION).
8. Creating the aim-function, in which framework every single ranking value should be replaced with the value calculated in the process of optimization (c.f. VLOOKUP-function). Replaced values should be summed up (SUM-function). Distance of facts and estimations should be calculated (DEDUCTION). Fact-estimation differences should be aggregated along the error definition (e.g. SUMSQ-function).
9. Turning on the solver, where the aim is to minimize the model error, the restrictive criterion is to compel expectation (distance>=0 in case of neighboured stairs), the altering range is by itself the appointed range for step function.
10. Implementing the above mentioned steps on inverse learning pattern (where directions are the opposite of the direct run).
11. Confronting direct and inverse estimations and fact apropos of consequence-variable with IF-function.

12. Creating explanatory text panels with IF-function.
13. Calculating further partial results: e.g. amount of first step levels (i.e. genetic potential) and measure of dependent variables' contribution (%) according to consequence-variables, correlation calculation among estimations and fact, verification of estimation's and fact's amount-equality etc.
14. Developing models which can be compared with each other at logical level and which lead to comparable partial results through optional repetition of above mentioned steps.

Application Possibilities of Similarity Analysis

In the followings possibilities of similarity analysis' almost universal application is coming in form of brief drafts. First of all it should be represented which similarity analysis is not:

- with which mobile phone-tariff will the client benefit from beside given consumption behaviour, it is a simply calculation (account-simulation), i.e. this is not similarity analysis,
- which credit is the cheapest among credit variants satisfying KO-conditions, this is a kind of present value-calculation challenge, but not similarity analysis.

However it is similarity analysis if we look for the best price/performance-related credit depending on every parameters of credits (including density of bank branch networking, behaviour of assistants on the spot etc.), where it is possible, that based on financial calculations the credit is favourable (complex "price" of the credit is low), but the circumstances suggest that there cheap meat produces thin broth.

After the introduction of negative examples and a transition with the same brevity positive examples are following. In the next chapter rural development respects of similarity analysis is going to be highlighted: http://miau.gau.hu/miau/dipo

Summary

Similarity analysis (SA) transforms the biological intuition into source codes. Therefore SA can interpret sustainability in a mathematic way using the deepest operationalization level as far as possible. SA can also be defined as the result of the artificial intelligence research concerning biological objects in individual and emergence-oriented frameworks delivering a self-monitoring control and consistence-based simulation. So, the SA creates the basis of the new generation of robots keeping in mind the optimum energy consumption (for individuals or robot-teams) assuming information technology support.

The system of My-X has already closed several partial automation and scaling steps: the next step of the development is the production of whole optimization of the targeted data-driven system. This means the creation of sophisticated control processes around the available modules, possibly its development in frame of grid-systems: e.g. in the case of targeted robot-vet/breeder the automatic exploration of disease-suspicions based on individual-specific data of the supervised biological systems, the simulation of expected effects of therapy variants, the forecast of expected yields, the simulation of inter-individual interaction, the strategic and operational definition of breeding goals, the denomination of paired individuals, the evaluation of keeping technology alternatives.

The self-monitoring learning process is sustainable and consistence-oriented, so it does not lead to arbitrary decisions: in the case, when the robot can decide only by draw among the recognized alternatives, then the involvement of the human expert is possible.

The above outlined example of robot breeder can be extended to decisions of crop production, horticulture, plantation or fishing, and also of wildlife management and forestry.

Vision

Integral system building, the continuation of started processes will be also important in the future as the meaning of My-X denotation is none other than My eXpert, i.e. human thought closed in source code which is constantly available, which can operate with constantly same quality, effectiveness and efficacy. My-X research team aims to operate as a fix point - every time there, where openness is the biggest - in the continuously changes in the system of research activities in the future. This can mean field of social science and teaching methodology in the near future. Thinking methodology arc of the research team now covers a quarter century interval, and significant part of this period has been continuously presented by the Medium on Internet for Applied/ Agricultural Informatics in hUngary, i.e. miau.gau.hu since 1998. In the future research team will not have traditional regulation for accompanying persons: i.e. who find each other in connection with the joy of co-work, co-thinking, they also find an intellectual "home" at the same time here. Aims of My-X research team will not change in the future, i.e. transformation of human knowledge generated intuitively into source code and the automation of this coding process will be in focus, i.e. the creation of such artificial intelligences which are able to generate intuition mechanically, where the machine is the carrier, incarnation, defender of human thoughts and the guarantee for its continuous and fast operation. My-X research team tends to have every field affecting research and its surrounding canon under a magnifying glass. In this way My-X mentality impact and react to long term processes: e.g. to request and undertake reforms on the field of theaching methodology as well as to the none-escape from

every-day operative action for the quality assurance of instructor, researcher work, to the formation of novel communication forms (i.e. paraphrase-based studies), to explore data-patterns available behind every traditional human expression, and to deduct evidence from these where a kind of fuzzy nature/gradation will be acknowledged in connection with the proof and term-creation which variegation should impact towards the increase direction of thinking's consistence (automatic and automated).

The concrete basis of My-X mentality is the increasing module family and application set of examples using similarity analysis. Similarity analysis tries to operationalize in the future the most ancient, most general layer of human thinking, all intuitive art of comparison as automatable level as possible. Similarity analysis remains a kind of bridge, among today esoteric and already scientific hermeneutics activities.

Methodological developments allow and desire the interdisciplinary expansion. In the near future it is an important aim to catalyze such business activities which approach start-up definition and which allow to demonstrate factory-like operation next to classic processes of human expertise so far.
Beside the market entrance, which prerequisite is to build, support teams who are able for this, development cannot be stopped either: knowledge elements and these automated linking forms so far can lead to new questions during every single application, these can point out new phenomenon which have not been interpreted yet, which should immediately turn into organic parts of methodology's maturation process.

The seven Regional Innovation Agencies provide the following services with national coverage based on its and principally on the other six organizations' competence, capacity:

Valuation and development of innovation-managing system:

- Preparing Imp3Rove classification
- EFQM
- CEN/TC 389 "Innovation Management" standard
- Accredited innovation manager training

Enterprise Development:

- ISO 14001 integrated EMAS system
- Preparing GRI G3 and G4 sustainability audit and reports
- Soft lifecycle-analysis and lifecycle-based product- and service development
- Online energy-efficiency evaluation and benchmarking of SMEs
- Green procurement and public procurement consultancy
- Services of data asset-management
- Cluster-management
- Tender consultancy
- Technological and research-development consultancy
- Legal consultancy
- Market research, marketing
- Preparing price strategy
- Preparing business plans, feasibility studies
- Accredited company consultancy on innovation management field

Supporting Start-ups:

- Mentoring
- Industrial property services (on basic-, medium- and upper level as the partner of Hungarian Intellectual Property Office):
- Evaluation of Intellectual property (based on the collaboration with Hungarian Intellectual Property Office with the usage of intellectual property evaluation toolbox)
- Education, preparation of starting businesses (with 3-volume teaching materials)
- Business planning
- Investor-business angel intermediation

Innovation awareness raising:

- Engineer Theater - jointly with Sándor Weöres Theater
- InnoPub
- "The drum is gyrating for you"
- Science Café
- Science Festival
- LEGO-robot programming competition

Innovation trainings:

- Innovation manager trainings
- Cluster-management training (with textbook)
- H2020 trainings
- Supporting foreign mobility of young entrepreneurs

Network- and consortium building:

- Mediating innovation network - relations having wide range of national and international partnership
- Representation in Brussels for the support of project-development and information intermediation
- International networking memberships

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