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PROSPECTIVE IMPACT OF BUSINESS SIMULATION GAMING ON THE PUBLIC SECTOR MANAGEMENT

Example: we have successfully…

- Reached the shimmering **moon**.

- Harnessed the **energy of the atom**.

- Mastered **global communication**.

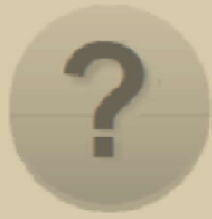- Invented the **computer** which spawned tens of thousands of useful and not-so-useful things.

But... Although man can travel to the moon, he is **unable** to devise a **better transportation** system on earth.
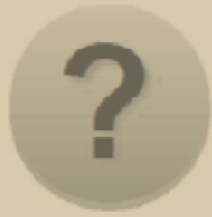
...Why?

? How do we accommodate the growing number of riders on our transportation system?

? Can we continue to maintain and preserve such a vast transportation network?

? We need to reduce the transportation system's impact on the environment!

? Costs continue to spiral out of control. How do we reign them in?

? How do we increase our partnerships and integration with other transportation networks for the most efficiency and effectiveness?

Can't we just use scientific analysis to figure it out?

Unfortunately, no. Complex Decisions Cannot Rely on Analysis Alone
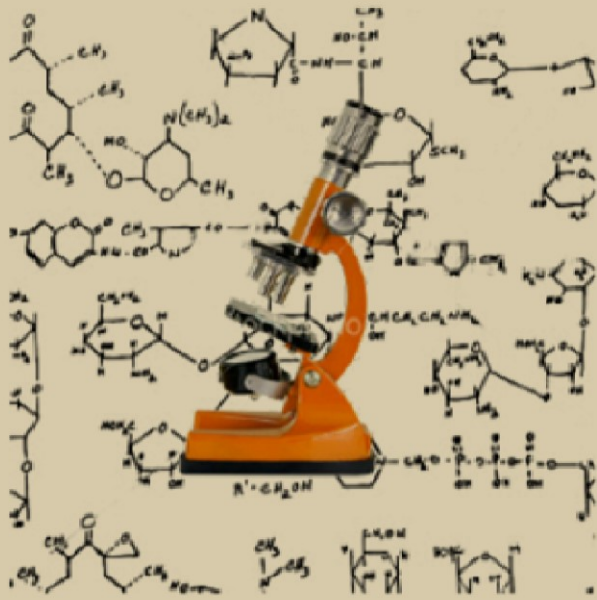
Analysis is the backbone of science.
It's what got us to the moon.
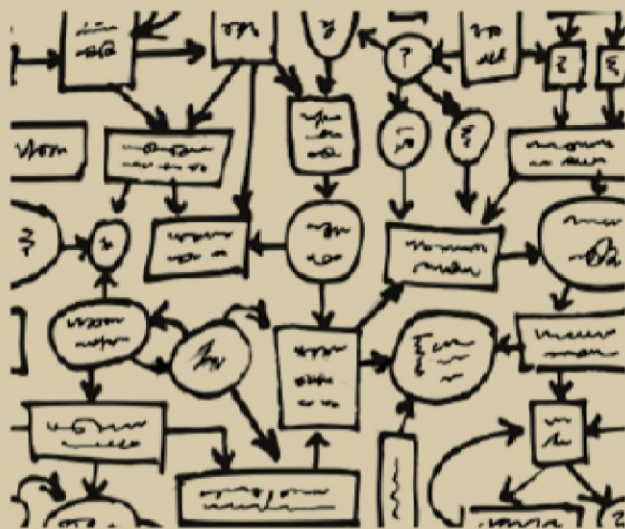
But analysis alone cannot solve
the problem of transportation.

PRIVATE VERSUS PUBLIC SECTOR

- Business education involves studying applications of mathematics, economics and behavioral sciences to problems concerning the production and distribution of goods and services.

- Thus the applied nature of business education is a prerequisite.

- Certainly for these reasons Business Simulation Gaming (BSG) is a successful tool in business training

PRIVATE VERSUS PUBLIC SECTOR

- Obviously, management in the Public Sector (PUS) differs from decision making manner in the Private Sector (PRS), which depends mostly on a size of the business, its market's orientation and branch it operates in.

- However, during the last 25 years, decision making in PUS has undergone significant changes and has become more and more complex.

PRIVATE VERSUS PUBLIC SECTOR

- It is essential now to evaluate not only particular inputs and outputs, as well specific elements of a system, but also the system's changing environment previously negligible such as: ecology impact, long-term strategies of national and multinational corporations, impacts of further research and developments, perspective of sustainable development etc. (Mezera, Krupka, 2016, 2013; Krupka et al., 2011).
- PUS is affected nowadays even by price competition from PRS.

NEW AGE OLD IDEAS?

- It seems important to realize that the PUS exists nowadays in the same economic reality what the PRS. Probably that is why PUS has already begun to take over and apply the same tools applied for a very long time by private sector e.g. Enterprise Resource Planning (ERP), Customer Relationship Management (CRM), and other Business Intelligence (BI) systems.

NEW AGE OLD IDEAS?

- It is undeniable that one is not better informed by the mere fact that it gets more information. An excess of data can be a direct cause of one's ignorance.

- Noticeably, the development of electronic data processing has as far insignificantly contributed to understanding of the complexity.

- Surprisingly, it has even enhanced the process of splitting reality into fragments.

NEW AGE OLD IDEAS?

- However, adequate multimedia programs may help handling complexity by getting acquainted with pattern recognition and a parallel processing of the interconnected levels of the reality.

- It seems that Simulation Aided Gaming (SAG) as a more general category of BSG becomes therefore very attractive.

GAMING EXPERIENCE

- For example in the Simulation Aided Game called Ecopolicy® (Vester, 2015), all sectors of human life e.g. quality of life, environmental stress, education, production, population and politics are interlinked.

- They are connected in such a way that results of a single decision are literally spread within the entire system, and have their repercussions and consequences in all areas of the game, alike in the real life.

GAMING EXPERIENCE

- In order to intensify the game experience the logic of fuzzy sets is used. It enables qualitative factors to be integrated within the simulation gaming process as well.

- Elements like for example sympathy and antipathy, approbation and disapprobation, attractiveness or harmony are unquantifiable in their nature and as such they are very hard to be reflected in a virtual environment.

EMOTIONAL EXPERIENCE

- It is believed however that these sensations attributed to the right side of human's brain are very crucial in cognitive processes and perhaps even the core of human's cerebral performance.

- Thus, it is paramount for a Simulation Aided Game to have these sensations reflected in the gaming process.

CYBERNETIC APPROACH

- Noticeably, fostering better understanding of complexity without increasing the flow of information is a fact too.

- Ecopolicy® for instance as a cybernetic simulation game is designed in the way which let to experience the pitfalls of the usual practice of concentrating on isolated problems.

UNDERSTANDING COMPLEXITY

- Focusing and solving only one problem, in the same time being unaware of the systemic repercussions it entails, usually leads to several new problems.

- Making complex decisions and dealing with complex processes and their cybernetics in virtual environment let to gain credible experience and appropriate attitude in order to successfully avoid similar traps in real life.

EMBEDDED EXPERIENCE

- It is claimed for a long time (Gee, 2007) that human learning is not just a matter of what goes on inside people's heads but is fully embedded in a material, social, and cultural world.

- It is also claimed that humans do not often think at their best when they try to reason through logic and general abstract principles detached from experience.

PATTERNS RECOGNITION

- It seems people think best when they reason on the basis of patterns they have assimilated through their actual experiences.

- Certainly, these patterns become generalized in time, but these generalizations are still rooted in specific areas of embodied experience.

GIANTS OF THE NEW AGE

- Cadotte, E.R., Bruce, H.J. (1997). *The Management of Strategy in the Marketplace*. Knoxville: The University of Tennessee.

- Gee, J.P. (2007). *What Video Games Have to Teach Us about Learning and Literacy*. New York: Palgrave Macmillan.

- Vester, F. (2015). *Ecopolicy*: *The Cybernetic Strategy Game*. Munich: Management Cybernetics Bionics Publishing House.

POSSIBLE DISADVANTAGES?

- **Anchorage** – decision makers do not respond to new information because they are attached to initial judgments;

- **Reasoning Through Analogy** – transfering of known simple cases to more complex ones (problem simplification phenomenon);

- **Illusion of Control** – inappropriate risk assessment due to overestimation of control.

RESEARCH QUESTIONS

- The following questions were asked in the questionnaire containing standard five degrees Likert's scale (Likert, 1932) for answers:

RESEARCH QUESTIONS

- Question 1: *Before some product is introduced to the market, sometimes it is tested on a sample market in order to gain response. Taking the above into consideration, do you agree that a participation in strategic simulation aided games is a valuable source of gaining experience in how to operate under conditions provided by real life?*

RESEARCH QUESTIONS

✖ <u>Question 2:</u> *Basing on your experience with high external validity simulation aided games, do you agree that experience obtained during simulation aided gaming can improve your competence for pattern recognition (the perceptional ability to see relations among seemingly unrelated phenomena) in the environment provided by real life conditions?*

RESEARCH QUESTIONS

- **Question 3:** *Assuming the high external validity of simulation aided gaming, do you agree that it may be used to verify the participant's capability to see the real world problems from their holistic perspective i.e. their interwoven and interconnected character?*

SAMPLE CHARACTERISTICS

× The survey was being conducted longitudinally in two lots during the last four years on respondents from Polonia University in Czestochowa (PUC). The respondents were international students of PUC – mostly from India and Cameroon, but also from Kenya, Nepal, Mexico, as well from a few European countries e.g. Georgia, Ukraine, Romania and Belarus – all of them with various experience in the PUS management, which was acquired during their intensive curriculum program.

SAMPLE CHARACTERISTICS

× Participants used Virtonomics® (the economic strategy game) and Ecopolicy® (the cybernetic strategy game) as their source of experience. The research had an exhaustive character and was conducted in two periods i.e. 2016-17 and 2018-19. One hundred four (104) participants were examined in the first research lot in the years 2016-17, and one hundred fifteen (115) respondents participated in the second research lot surveyed in the years 2018-19.

SAMPLE CHARACTERISTICS

- It is said (Atkinson *et al.*, 1987), that a possibility to generalize results (although primarily statistically unrepresentative) obtained in the above way exists, provided the research is exhaustive, respondents are characteristically unified, and the differences among statistics calculated on the research basis are stochastically insignificant.

- Thus, the two lots of survey's results will be examined – Table 1-2.

Tab. 1: The response structure for the questionnaire survey – lot 1.

SAG – strongly agree, AG – agree, IND – indifferent, DSA – disagree, SDS – strongly disagree.

Questions	SAG*	AG*	IND*	DSA*	SDS*
Q_1	37/104	50/104	7/104	10/104	0/104
	Σ=83.65%		6.73%	Σ=9.62%	
Q_2	40/104	55/104	5/104	4/104	0/104
	Σ=91.35%		4.81%	Σ=3.85%	
Q_3	35/104	48/104	9/104	11/104	1/104
	Σ=79.81%		8.65%	Σ=11.54%	

Source: Author's research data

Tab. 2: The response structure for the questionnaire survey – lot 2.

SAG – strongly agree, AG – agree, IND – indifferent, DSA – disagree, SDS – strongly disagree.

Questions	SAG*	AG*	IND*	DSA*	SDS*
Q_1	38/115	57/115	11/115	9/115	0/115
	Σ=82.61%		9.57%	Σ=7.83%	
Q_2	50/115	56/115	6/115	3/115	0/115
	Σ=92.17%		5.22%	Σ=2.61%	
Q_3	40/115	53/115	10/115	10/115	2/115
	Σ=80.87%		8.7%	Σ=10.43%	

Source: Author's research data

THE RESPONSE STRUCTURE ANALYSIS

- Noticeably, the positive answers relative frequencies (SAG+AG) for particular questions presented in Table 1 are in close relation with their counterparts presented in Table 2.

- the purpose of this research is to prove with some reasonable level of certainty that the differences among above mentioned relative frequencies are statistically negligible.

THE RESPONSE STRUCTURE ANALYSIS

- The statistical indifference of relative frequencies differences for particular questions examined in two lots (Tables 1-2) can be assured for the following levels of certainty:

- Q_1: 83.67% (U=0.206),

- Q_2: 82.34% (U=0.223), and

- Q_3: 84.30% (U=0.198).

Source: Author's statistical examination

THE RESEARCH SUPPORTS THE FOLLOWING STATEMENTS:

- Simulation Aided Gaming (SAG) is a valuable source of gaining experience in how to operate under conditions provided by real life;

- experience obtained during SAG can improve humans' competence for pattern recognition i.e. their perceptional ability to see relations among seemingly unrelated phenomena;

- SAG may be used to verify humans' capability to see the real world problems from their holistic perspective.

THANK YOU!