

# Factorial connections in the organizational innovation: proposed systematization

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# Introduction – hypotheses and aims

- **H1:** There is a critical mass for each innovational factor and for the whole aggregate
- **H2:** There is a critical mixture of organizational creativity and innovation factors
- **Aims:**
  - to explore and systemize the arguments for the theoretical validation of these hypotheses
  - to propose a concrete manner of estimation for the costs and remunerations of innovational factors for an organization

# Steps and methodology

- Documentary study – analysis and synthesis
- Deductive approach, as well as abductive (intuitional) one
- Steps:
  - identification of exogenous variables of creativity and innovation,
  - analysis of each variable (factor),
  - identification of factor's effects (endogenous variables of our analysis),
  - proposed coherent system of factors, as a function of cause-effect type,
  - identification of key action variables for the organization,
  - building possible relations for the estimation of costs and remunerations (matrix)

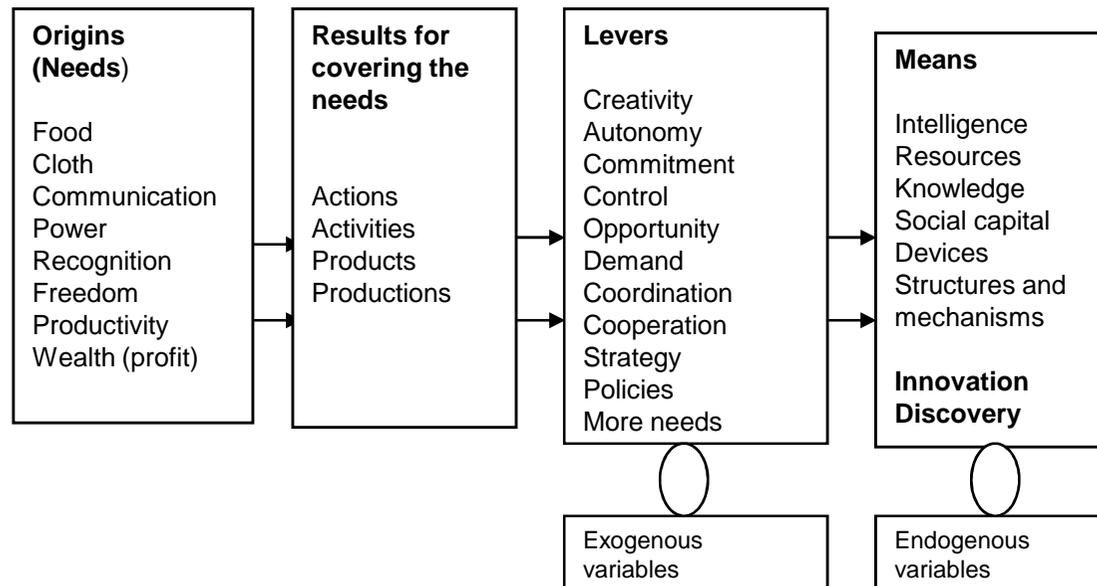
# Important premises

- Innovation = Invention + Exploitation
- Open organization (inside-outside of the firm)
- Innovation is a perpetual continuum
- Three dimensions - resources, knowledge and social capital
- Separation between technological and administrative innovation
- *Main works: McAlister & Pessemer 1982, Wernerfelt 1984, Amabile 1988, Barney 1991, Roberts 1997, Nahapiet & Ghoshal 1998, Meulen 2002, Spence 1994, Bouchard & Bos 2006, Yuan Li, Yongbin Zhao & Yi Liu 2006, Burns 2007, Lucy Lu 2008, Philbin 2008, Declan 2009, Ming-Ten Tsai & Shuang-Shii Chuang, 2009*

# Systemic analysis of OI

- Factor = a characteristic of a process, dimension or the phenomenon itself, as cause or effect
- Variable = factor in movement, theoretical evolution; giving all possible values from a determined interval to a factor, we obtain the corresponding variable
- Three interdependent universes - international, national (including regional and local) and the market, with company and OI in the middle

# Important connections



# Systematization of innovational variables I

- I: predispositional variables:
  - sensation, uniqueness, capability
- II: situational variables:
  - personal change, needs, dissatisfaction, inadequacy
- III: decisional variables:
  - individual autonomy, individual commitment, control through resources, motivation

# Systematization of innovational variables II - operationalization

- Aggregate every group in just one variable, which can be expressed as an intensity index, considering the situation of the enterprise
- Group I: index or degree of covering of basic individual needs at the enterprise level, using a Maslow pyramid or similar in order to establish weight coefficients for every need
- Group II: similar aggregated variable, considering specific needs, influenced by cultural characteristics (country, region), organizational and professional cultures (aside from personality or psychometric tests designed to measure the need for uniqueness or other personality traits)

# Relationships and estimations I

- Endogenous variables - behavioral dimensions pushing innovation: predispositional and situational at individual level, decisional (autonomy and commitment) at organizational level
- Exogenous variables - control through resources and different motivational levers
- Basic relationship for the factorial innovational connection (1):

$$(1) Y_j = f(X_i) + e_{ij}, \text{ where:}$$

$Y_j$  is the level of the result expected for a particular innovation, if we use the amount  $X_i$  for the factor  $i$  of innovation;  $e_{ij}$  is an estimation of the residual between the theoretical value and the real value of result  $Y_j$  related to variable  $i$

At the level of a factorial innovative system, the formal relationship could be (2):

$$(2) Y = f(X_1, X_2, \dots, X_n) + E, \text{ where:}$$

$Y$  is the total result (benefit, profit etc) expected from that innovation, remunerating the respective factors with the corresponding amounts  $X$ ;  $E$  is the total residual between the theoretical value and the real one for  $Y$ .

# Relationships and estimations II

In principle, we have (3) :

$$(3) Y = \text{Sum}(Y_j) + \text{Sum}(e_{ij}),$$

but in reality the final theoretical result is a complex aggregation of partial functions. The suggested relations are econometric type, emphasizing a stochastic dependence between the specific variables.

In principle, we can accept the idea that each factor has a marginal cost and gives a marginal effect; thus, there is a marginal productivity for each factor, with the same type as elasticity effect  $y$  in relationship with a variable (4):

$$(4) E y/x_i = \Delta y_i / \Delta x_i, \text{ where :}$$

$y_i$  is the effect of the innovative activity (benefit, profit obtained through innovation);  $\Delta y_i$  is the augmentation effect due to the innovative activity, in relationship with previous realized benefits;  $\Delta x_i$  is the supplementary effort (cost) necessary for the factor in order to obtain the augmentation of profit through that innovative activity.

Relationship (4) can help us estimate the maximal remuneration (cost) of the respective variable ( $x_i$ ) according to the profit she will bring to the enterprise.

# Conclusions

- It seems logical to define and estimate a certain critical mass for each innovational factor, in a specific combination that could bring the best results.
- This critical mass could be integrated in a critical matrix of innovation, considering the characteristics of each system/enterprise and each problem that needs to be solved.
- We suggested the general dimensions of the most important innovational factors that could be used to build such a critical matrix – if it exists.
- The next step would be to gather data on similar innovation types from similar industries, but different organizational cultures, national cultures, environments etc. and try to build and validate the specific measurement instruments (scales and indexes) that would bring us to the critical mass matrix of innovation.