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Sustainability and Quality of Life Modeling the Complexity of Governance

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1. Introduction

The Quality of Life index is a well known measurement schedule able to compare the citizen's life facilities across countries of the world. It is based on rational and factual parameters such as Gross National Product, per citizen health spend and gender equity. The criteria has to be be reinforced by psychological approaches like those used in customer satisfaction and Total Quality Management. My studies validate the theoretical role of QoL as attribute of sustainability. I have represented this concept with Makovian reverse processes in political systems.

I studied the different attributes of the Quality of Life in a first approach from the research literature, elaborating a structure of these elements. In a second approach, I made interviews of citizens about their Quality of Life perception, with the "voice of the customer" method (Kano [1] , Griffin – Hauser [2]). A validation came also from companies with studies of customer needs and expectations, particularly in the health field.

The presentation of these previous works concludes showing confusions between Quality of Life, well being, health, happiness, liberty. Then come the effects analysis in the sustainability and the policy definitions with the place of sustainability and safety in political systems, allowing us to use a Markov model description [3].

The impact of Quality of Life's variability perception in the instability of political systems drive politicians to better understand sustainability and safety processes functioning. Its useful for politicians to improve the political system and avoid to provide short term answers to citizen's unsatisfactions with a lack of mastery. So I understood that the analogy was relevant in management applications in firm's governance, driving this research to focus on the enterprise analysis in the second half of the document. Observing technology and industry history conducts us to describe the effects of growing complexity in these organizations. My presentation will observe the limitations of the ancient linear models and proposes the analysis and the opportunity of cross reverse differential ones such as Markov. These works conduct towards a partial study of interfaces with human beings and suggest producing simplifications by aggregation method and Markov model describing Quality of Life's place in sustainability and complexity of governance.

The question arises of the Quality of Life (QoL) definition which is a usual standard well known and used in governments' publications. It is also frequently used in the daily discussions of customers and citizens about their personal needs, expectations and requirements. But the concept is very difficult to understand due to the lacking sense which should come from its quality definition and lacking available measurement which should come from a factual quality control process.

I propose to begin with a theoretical approach about the QoL theme and a survey designing the map of common parts, discriminations and links between QoL, well-being, health, safety, pleasure, and sustainability. Making studies for many years in a lot of companies on management and on quality services, the members of our laboratory can observe quality products, change management, organisational development and polls, doing situation maps and structuring the data to nurture the research. In companies and state offices I had a practice of the "voice of the customer" method (Griffin, Hauser [2]), (Shiba, Malsh, Lepage, [4]). Our laboratory stocks a large data base about QoL's perception, which has been used in this research. A particular survey is used in this research to validate our assumptions. It comes from customer's needs and expectations from a pill-maker which offers to our laboratory to study governance, products and services. We can take this opportunity of internal observation of the companies to know if the same attributes of Quality of Life and sustainability appear to build the governance style perception. The central assumption for this research can be proposed here: is it relevant to consider that the QoL concept has the same sense in both the entrepreneurial area and the public political area? If I could prove that the attributes are similar to those from political system, it would be interesting to test the same calculation mode between the attributes and the governance concept using the same Markov model.

2. Markov model application for the Quality of Life concept and the global research approach

This part can be deeply studied regarding Markov system experts (Mauldin, Urbanski, [3]), (Heylighen, [5]), but offers also some improvements of our analyses which has been made in our laboratory from ten years. For the study described in this paper, I describe hereafter the research approach which has been deployed at each time with the same global research design:

-   Exploration phase, with One on One interviews made by myself accompanied with a PHD student preparing his thesis under my responsibility , or (most of the time) with a project managers who were employed by the companies in which I have been implied with a contract from my laboratory to do research studies;
-   The One on One Interview method is applied with an interviewer and a second person taking notes to catch the voice of 24 customers. It consists in factual explicit expressions with observations of the environment, context and client mind representations to be able to elaborate the implicit and the latent needs or ideas or opinions of the interviewed person (see Hauser [2], and Shiba [4]);
-   The elaboration of a Kano questionnaire (see Kano method [1]) from the structuration of the interviews data in affinity diagrams;
-   The validation with the returns of questionnaires sent to 80 customers (different from the first one interviewed) to verify the reliability of the information caught in the first phase;

- The elaboration of the outcomes of the survey (charts, tables,… to represent the opinion of the people interviewed or questioned);
- In each case described in all the parts of this paper the person implied in the research were the project managers in the companies (or sometimes the PhD student when we had to interview citizens on the streets) with me on all phases of the research approach. In all these cases I made the interviews with a panel of company's board members, who were members of the project inside the company (new product or service elaboration, improvement of the organisation, change management…). The typical panel is made of experts in Marketing, Quality, finance, Production, Procurement and sales, Maintenance and Information System. At each time I trained these members on interview and Kano questionnaire practice.

This global design of the research approach has been elaborated by Von Hipple, Griffin, Hauser [2] with a 90% reliability level. It is based on the Beta – Gauss model, which we have tested on 22 product and design applications in companies with our laboratory, with the same reliability result.

All the applications presented in this paper used exactly this research frame. But in each case I propose in the further parts of the text the details of the number of people participating to the surveys, the 2 people involved in driving the interviews and Kano validation, and the profiles of the organizations observed in the samples. We can see these details in parts 1.3 (Markov base model), 3.0 (QoL / management and politics), 3.1 (correlation between management and politics), 3.2 (application in health field). These research design details are done in these parts as "research context" denomination .

2.1 Previous research in un-linear models with our Markov application on customer satisfaction

This theoretical approach has been made with an application I made on a leisure park. This approach was used to take immediate quality feedback after each observation of drift in the satisfaction of the customers (Qualisat, deposited method, INPI, A. Lepage [6]). I can confirm, as said by Kano that concerning all products/services, only 20% of them, classified "explicit expectations" follow a linear answer (Kano [1]), (see also Edvardson, Gustafsson, Enquist, [7] about correlation between satisfaction and memory of personal life events). In 1998, at the "Assises Nationales de la Recherche en Qualité" seminary, Versailles, France, I explained that the service quality measurement is reliable in relative comparative results between some tiny similar events, or same events measured in same conditions many time on small detailed topics, but never in absolute or large value. This gave the idea to apply Markov models on satisfaction because it allows usually to calculate the global availability of a equipment from the detailed failure ratio and repair ratio. In this application, it allows me to calculate the global satisfaction of the whole participants to the site's exhibitions from the local variations of satisfaction in small teams of participants.

The Markov models (Mauldin, Urbanski) were also choosen to describethe complex global satisfaction phenomena with their ability to synthesise cross reverse dynamic processes. It is based on the calculation of the probable position in a real situation between two extreme, ideal, theoretical situations relative to the number of basic team repairer-originators (elementary team members, carrying out routineby re-designing or repairing). It should be remarked that the definition also means: "zero dissatisfaction of the customer, between the

moment 0 and the moment T of analysis", which supposes a measuring instrument available from time 0 to time T. The problem which I had to solve was also the implicit assumption of the observers about a previously-established linearity (without any validation) to model the satisfaction.
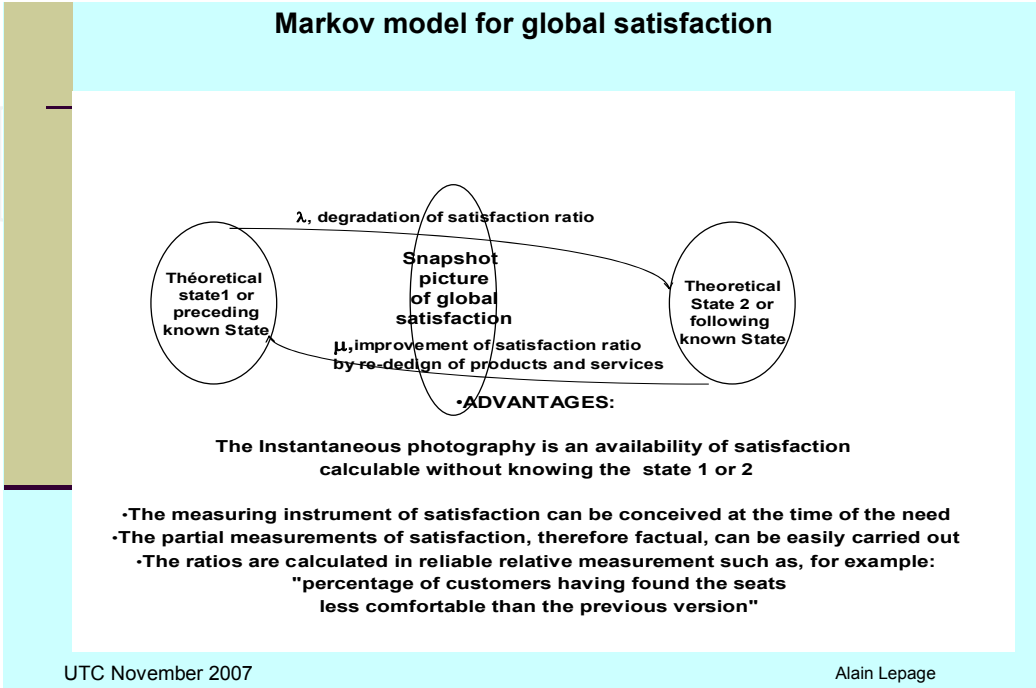

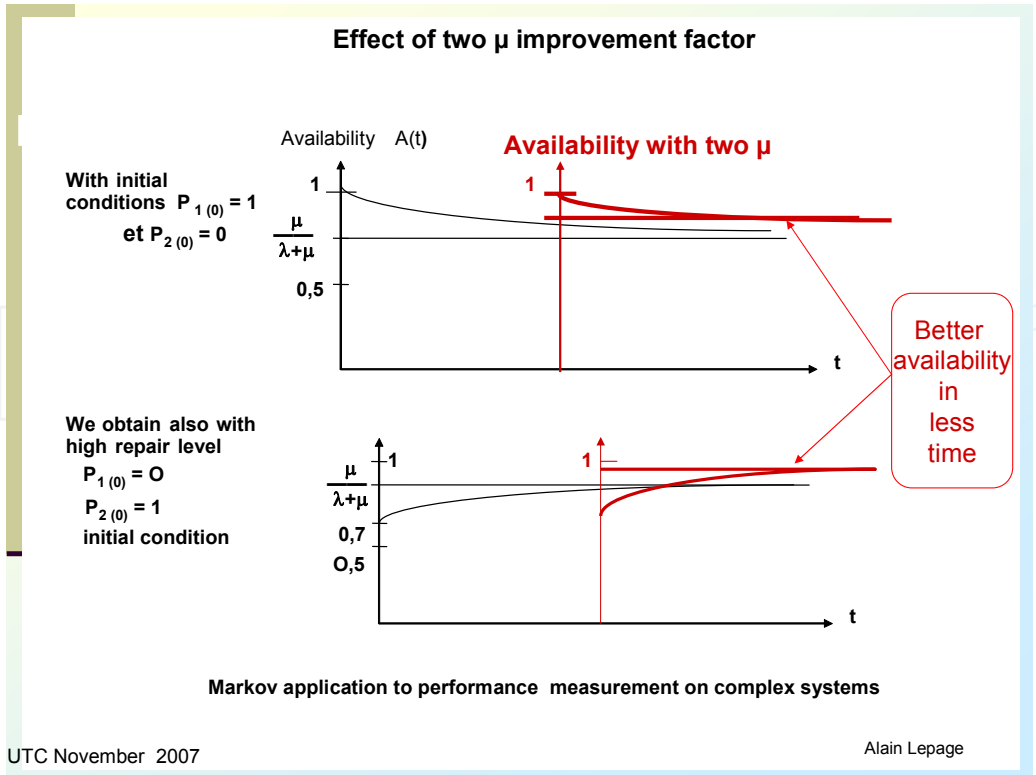Fig. 1. Markov model for global satisfaction (A. Lepage)

Fig. 2. Re-design level of reparation to satisfaction result (A. Lepage)

The research context in which this application has been made is done as under:

- Interviews and Kano validation made on 280 person all clients of companies which offered a research contract to our laboratory; these clients were final customers (so, citizens, 70%) and enterprises (30%) ;
- The survey has been deployed on 12 companies (the first for Markov model elaboration was a leisure park, and all the others for Markov model validation are shared between car constructors, equipment makers and bank or insurance servicing);
- I drew myself the survey as co-project manager beside the internal project manager of the company, and made a training phase to the members of the companies until they were able to practice interviews.

2.2 The first application of the Markov model on the political system evaluation

Here the quality perception is relative to the image seen by citizens when they understand the quality system presented by politicians in their political program. This is a description of a future proposed to listeners modelled in 2 reverse processes (see figures 3 and 4, and Lepage, [8] TAR journals, 2006). The first process moves concerning sustainability. It is made up of many resources, supports and actions which offer citizens a better quality of life. What is defined as sustainability is the measurement of the quality of the political system, as mentioned in the report on the United Nations Conference on Environment and Development (Landolt, and all, [9]). A more detailed definition is postulated by Afgan and Carvalho, ([10]): "the measure of the quality of our society is its ability to secure, and not compromise, the right of future generations to have a quality of life, at least equal to that of its own generation". Sustainability is seen here as people's self - organisation driven by the desire to obtain the best quality of life, under constraints of financial feasibility and individual and collective safety. However, some authors view sustainability as a measure of quality (Gianpiero, Mayuari, Postar, ([11])) and others underline the high level of complexity in the measurement of sustainability (Heylighen, [5]). The second process, of safety, concerns the natural effect of self - degradation (Levenson), particularly in the case of complex systems, with a worldwide measurement tool, the "World Disaster Report". The two processes can be evaluated with the same approach than this used in the measurement of quality. It can be considered that they hold a similar place in the conception of life.

The results of my research on Markov model applied to political system has been presented on several research conferences from which I can propose an extraction here after with 2 figures.

2.3 Markov model for QoL as sustainability attribute in political program

The model has been validated with our global research approach applied on citizens and public and private employees whose were interviewed at random, as they came to our environment:

- Interviews and Kano validation made on 120 citizens and 95 employees of companies in which a research contract has been signed with our laboratory;
- The survey has been deployed on all the counties of France;
- I drew myself the survey as co-project manager beside the internal project manager of the companies, and the citizen's interviews with a PHD student.
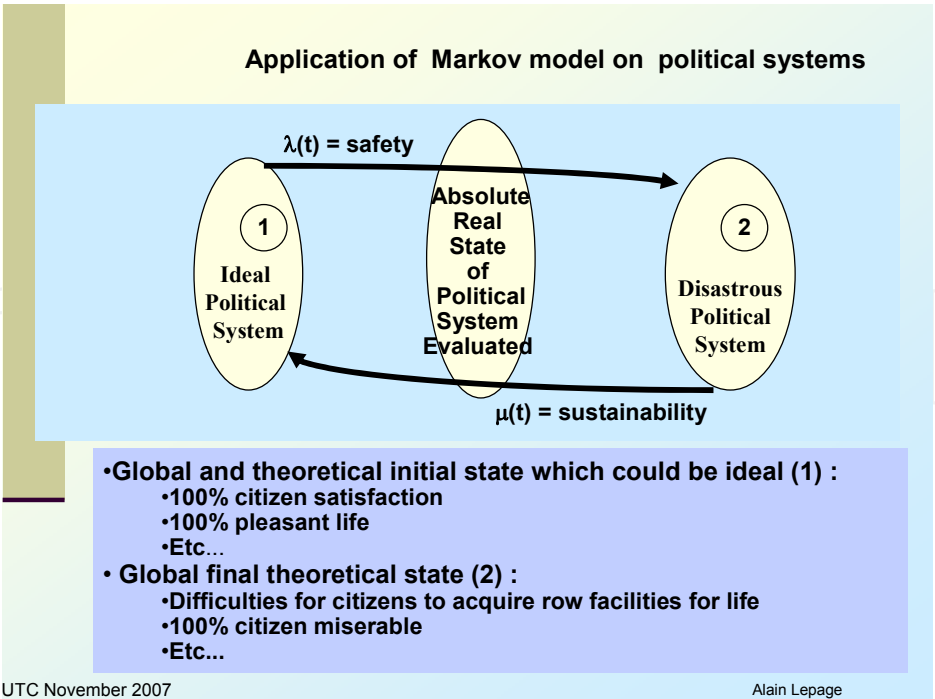
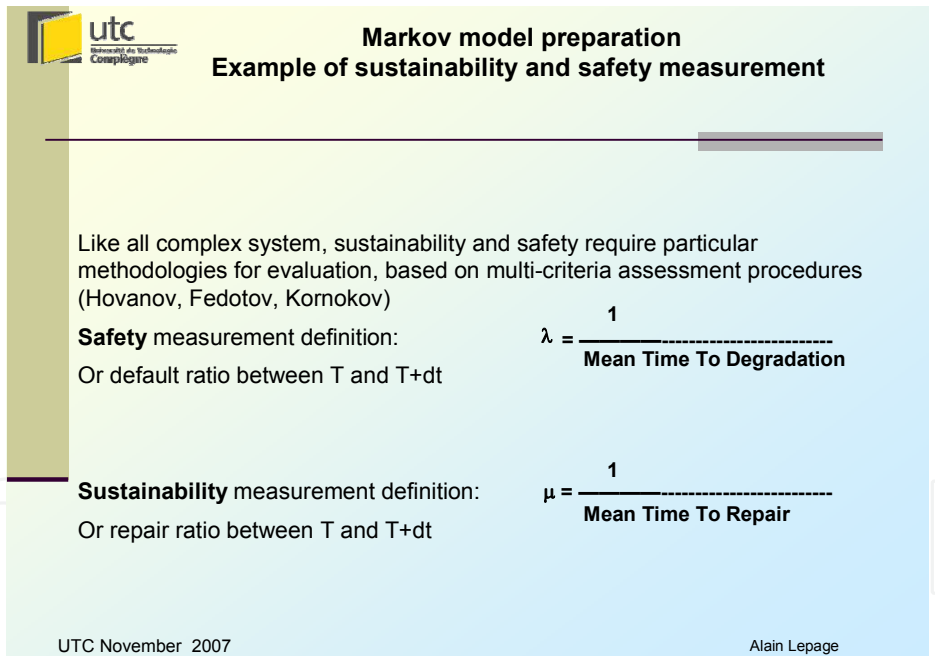Fig. 3. Markov model for political system evaluation (A. Lepage)

Fig. 4. Sustainability and safety position in political system evaluate

The complex process' evaluation requires a particular methodology based on multi–criteria procedures. This method is well-known as "The multi–criteria evaluation and assessment of complex systems". An example can be found in economics (Hovanov, Fedotov, Kornikov, [12]). My purpose was not to classify all the relevant criteria for the measurement of sustainability and safety in this previous research. My interest lies in the use of some of the criteria-elaboration methods which are available in the economic, organisational and systemic areas regarding the way they will be included in the Markov calculation.

The second interesting outcome is that sustainability offers some tools for its own measurement which can be apply in the current research on health in QoL. Afgan and Carvalho [10] made a synthesis of this sustainability with its four components, resource quality, environmental quality, technological quality and social quality.

So, I can promote this theoretical structuration of the links between the principal attributes in the roots and causes giving the mapping representation of the sustainability. One of them, QoL, will be particularly observed in this aggregation roots representation.

3. The concepts relative to Quality of Life

This concept has been studied for a long time beginning with old standards of measurement. Now, new approaches come just to confirm our description of QoL as a global satisfaction seen by citizens (ISQUOLS measurement, Cummins, [13]). In a large correlation between some experts' announcements and the common sense, everybody think that happiness can be synonymous of quality of life. If the perception is not completely the QoL we can observe that it is at least the principal attribute of the concept, having links with health, environment. Some authors confirm this observation like Rogerson ([14]) in his study based on Qol in Britain and some European countries.

3.1 The attributes of Quality of Life

The paper comes to present the different research roots which our laboratory had to examine regarding the Quality of Life. I can firstly summarize the principle attributes of the QoL which has been available and observed in the customer and citizen interviews. I propose secondly to analyse the importance of the psychological aspects in the QoL studies and consequently the lack of indicators and measurement, whereas would be the research results available in the cybernetics area.

3.1.1 The Gross National Happiness with its measurements

The Gross National Happiness (GNH) is often presented in holistic approaches as quality of life. I can have a kind regard to Jigme Shingye Wangchuck [15] who get Buthan's King power-shift in 1972, building an economy that would serve Buddhist spiritual values. Today he is walking across his country to convince his citizens to go to polls and gave their vote to another person than this lastly designed king (himself). The four pillars of GNH are the promotion of equitable and sustainable socio-economic development, the preservation and promotion of cultural values, the conservation of the natural environment, and the establishment of good governance. International centres like Genuine Progress Index Atlantic promoted GNH measurement (Rethinking Development) (see also and the Centre for Bhutan Studies). Classical liberal economists attempt to quantify happiness through measurements in consumption and profits (Hayek [16], Javorski, Friedmann, [17]) and sometimes as parameter of sustainable development (Ezechieli, [18]). The happiness is a well - known and self - obvious parameter easy to measure. From the research point of view I can ask what is their place sitting in a complete structuration of the quality of life's (QoL) description, and which is the part of Health and Human Development in the global QoL calculation. How much does it weigh?

3.1.2 Health and its perception as Quality of Life

Measurement of quality of life is used in health with Qualtity Adjusted Life Years (QALYS), and Disability Adjusted Life Years (DALYs). It is based on links between health, medicine and QoL (Pena, in The Economist Intelligence Unit). The cost of a treatment is usually measured by the cost per QALY, or per DALY (Bergner) with links on QoL (Landolt, [9]). All the authors relate the permanent confusion with well –being in patient perceptions of heath included in QoL. They think usually that the health quality of life comprises: happiness, freedom, standard of living. Pena studied and explained the linearity between the physical state of the body and the perception of QoL(Netz, Wu,[19]).

3.1.3 Human development as attribute of Quality of Life

Most of the customers and citizens perceive the two concepts as similar, but many authors who have been studying QoL and HD present the distinction between human development and QoL, like Dossa [20] since 1989. That basic qualitative part of human aspect of QoL is the physical one, presented by Morris [21] since 1970 as: percentage of the population that is literate + infant mortality rate + life expectancy. Today many interesting discussions share a new knowledge about these measurements. They fill an ancient lack in the description of the psychological and cultural attributes of the citizen's expression of their human perception of QoL, which I can call qualitative elements (Hout M., [22] from Russel Foundation, takes qualitative approaches as the most important part of living conditions). This experience of many people's perception of life surveys confirms these evolutions, adding that both customers and citizens decide clearly to make a volunteer mix between QoL, well - being, human being, happiness and family social uses which we experimented as attributes of global QoL.

3.1.4 Aggregation method for Quality of Life's measurement

We can find a schedule of Quality of Life description and measurement in the Quality-of-Life index (The Economist Intelligence Unit) elaborated in The Economist Intelligence Unit, and calculated on a unique methodology that links the results of subjective life-satisfaction surveys to the objective determinants of Quality of Life across countries. The index has been calculated for 111 countries for 2005. We have also a multicriteria model of QoL measurement proposed by Massam [23]. Life satisfaction is seen as a judgment that depends on social and culturally specific frames of reference. Often it is question of gross domestic product (GDP) per person, at purchasing power parity (PPP) in $ (Economist Intelligence Unit) beside other well - being indicators (Kahneman and Schwarz, [24]). Based on the QoL index, researchers validate some QoL factor's indicators:

- Material well-being (our laboratory keeps complete studies about global happiness (see Diener E., [25]) and happiness attributes in material well – being (see Frey [26], Stutz [27]), with an economical approach. There also this is the concept of GDP per person, at PPP;
- Health (life expectancy at birth, years. Source: U.S. Census Bureau);
- Political stability and security (source: Economist Intelligence Unit);
- Family life (divorce's rate per 1,000 population, converted into index of 1 (lowest divorce rates) to 5 (highest) (U.S. Euromonitor (see Desabled Family));

- Community life (Vias and Carruthers, [28] worked on country geographical and regional factors of development versus QoL). We can also use the Dummy variable taking value 1 if country has either high rate of church attendance or trade-union membership; zero otherwise (I.L.O.World Values Survey);
- Climate and geography (latitude, to distinguish between warmer and colder climates (C.I.A. World Factbook).
- Job security (unemployment rate, %)(Economist Intelligence Unit; I.L.O);
- Political freedom (average of indices of political and civil liberties. Scale of 1 (completely free) to 7 (un free)) (Freedom House);
- Gender equality (ratio of average male and female earnings).

3.2 The impact of human resource management from entrepreneurial and political areas

Many authors in psychology sociology quality (Cummins [29]) and philosophy have done some research works concerning the major importance of human aspects in political and organisational systems. It would be too long here if we expected to present a synthesis of their results, and it could be irrelevant to offer useful answers to our problematic. So I propose to observe a part of this knowledge really and actually opportune to understand the Quality of Life's expectations in the context of professional working in companies. It seems to me that an opportune research area could be the cybernetic one which presents new elements mixing internal working social and psychological processes in the firms and organizations with knowledge management and cybernetic models of the system.

3.2.1 Cybernetics and knowledge management at psychosocial aspects of QoL in enterprises

As I presented our works at Orlando in 2008 (Lepage, CCCT, [30]) I offered the elements coming from the Heylighen [5] presentation. It concerns the second – order cybernetics, comprising the effect of the observer in the system's description. The definition of second – order here is done by the fact that it is not only the factual analysis of a stable and motionless system that is important, but the representation of the perception of the dynamic system. This representation made by all the members of a working team at the same time in the process on which they work in the system makes them become the observers of the system. Passing from the analysis of the system alone to the global human workers and observers in and out the system consist in classify the system from first order to second order cybernetics. I proposed as under, a comparative presentation of the first order and the second order cybernetics:

The second-order consists in the system itself described by the observer. The second order consists in the system, and at least his individual observation, and all the human interactions, particularly with the environment. The second-order cybernetics is not reserved to machine intelligence application, as we could have supposed at the beginning of cybernetics studies, but first to human activities, particularly in organisations (see Pangaro [31]). I can describe hereafter the particular inputs and effects concerning the second – order cybernetics of our Markov system, and precise the attributes of the second order cybernetics in our case.

Author	First Order Cybernetics	Second Order Cybernetics
Von Foerster	The cybernetics of observed systems	The cybernetics of observing systems
Pask	The purpose of a model	The purpose of a modeler
Varela	Controlled systems	Autonomous systems
Umpleby	Interaction among the variables in a system	Interaction between observer and observed
Umpleby	Theories of social systems	Theories of the interaction between ideas and society
Definitions of First and Second Order Cybernetics		

Fig. 5. Source A. Umpleby, G. Washington University

Self-organisation in the firms

The importance of multidisciplinary collaborative team – members in organizations input a cybernetics configuration such those that have been studied by Ashby and Heylighen [5]. He explained that an organizational system comprises many subsystems which are under constraint created by self-organization becoming mutually dependant and adapted. So it is a freedom loss, like in the analogy of magnetic spins in a first time coming free, and became stable after being put closed to other ones.

It is also interesting to study Von Foerster [32] which added that self – organization can be enhanced by perturbations coming at random. It can make state and drive the system, called "order of noise" principle.

Knowledge management and en-action concept

The human participation in the team working inside companies had been studied on the knowledge aspects with the famous separate tacit and explicit parts of professional competencies (see Takeuchi and Nonaka, [33]). They describe the additional complexity in the organizational systems due to knowledge and behaviour sharing in the teams. This is a new parameters linked to cultural aspects. This takes part of the complexity particularly on the reverse impact of expatriate and spousal cross-cultural adjustment (see Takeuchi, Yun and Tesluk [34]). The organization depends on these crossover effects of contingency cultural impacts. I can also take in consideration the cross – reverse and cause – effect play of the rational and the emotional parts of the human being and human thinking in the organization system. This is at the centre of the cognitive approaches and particularly the en – action principle. In many cases, it's not clear that reason precedes always action. This is one of the effects of en – action that allows many researchers to consider this concept at the centre of organizational complex systems.

Individual emotions

Individual emotions and individual perceptions of citizens and customers are also at the centre of QoL, sustainability and political system. This effect has been studied by Hollenbeck [35] in cybernetics. We can particularly present the effect of emotions in the

external –internal situations of the organisation with observation of personal –team fitting to the system. I can consider that emotional stability is an important parameter of the organizational complexity and stability which can be seen as a contingency approach.

3.2.2 The lack of psychological aspects in QoL management

It is admitted that the human factors take an important place inside the system to improve the complexity. So, as a first evaluation I have explained that the human presence genders a second order cybernetics due to the knowledge, cultural and en-action principles functioning inside the team working. But conversely I have also explained that the human presence can reduce the dynamic movements. By this second point of view, by the effect of cultural, emotional and organizational aspects, it is confirmed that in the second-order cybernetics theory the important impact of the human presence drives a similar cross reverse process that the one I described with our Markov model.

4. The QoL concept applied to managerial and political areas

My previous research allowed me to propose some results as outcomes extracted from the validations in several companies. I can show, for example, some data analyses issued from two surveys. The first one analyses the QoL with a "voice of the customer" method (Griffin, Shiba, Lepage) applied in 2007 on French people questioned on their perception of actual life and their future desired. The second one is in concern with QoL measurement on a panel of medicine clients. As co-project manager beside the product manager (company's employee) we were together in charge of catching customer needs and design pills and health services as good answer.

The research context of this application is done as under:

- Interviews and Kano validation made on 150 person all members of companies which offered a research contract to our laboratory;
- The survey has been deployed on 22 companies (equipment designer for enterprises, car constructors, sub – contractors for car and aircraft construction, banks, public administration, professional chambers, internet services, etc);
- I drew myself the survey as co-project manager of internal projects in the companies with help from one internal volunteer employee.

For these applications we collected data from the employees inside the companies and also from the users of the services and products in the public environment outside. At each time employees and users told us what they had to say in answer to our question, without being forced to position themselves in their employee situation or personal and public situation. So our difficulty consists in getting some detailed explanations to correctly classify the answers in families (enterprise or individual/citizen). The complexity of some answers made this analyse more difficult, because the interviewed person does not separate professional from personal aspects in their answers, being unable to observe their own personal cognitive process.

4.1 QoI analogies and strong correlation between managerial and political areas

As we proceeded with the product manager to interview people inside companies (employees), or outside (citizens,) we collected a mixed and half shared data concerning

both professional classification (enterprise) and personal one (political system). It has been a huge work for our laboratory to separate the enterprise and the political aspects of the answers due to the sense of the sentences which have been noted with a factual constraint. But we have taken the opportunity of realizing a study with these mixed data about the relations between the QoL and its attributes and the professional or the personal area of these people. It has been easy for us to do an extraction of the vocabulary which they used to describe the QoL concept or its attributes. We can summarize here after the results with the correlations measurement.

The table shows in the last column, the correlation between political vocabulary and entrepreneurial vocabulary which is at a frequent strong level. We do not notice the least low level in the lines, which is a good similarity configuration regarding all the lines which are in the same concern in such entrepreneurial and political system language.

QoL / Attributes	Political Vocabulary	Correlation	Enterprenerial Vocabulary	Correlation	Similarity
Quality of Life			High stress working conditions	-0,8	
	Personal human consideration	0,75	Personal human consideration	0,9	0,68
	Global wages and options	0,8	Global wages and options	0,95	0,85
			Job satisfaction	0,8	
	Social standing satisfaction	0,7			
			Good relations withn colleagues	0,8	
	Smart design for working/housing	0,7	Smart design for working area	0,7	0,99
	Soft human ambiancy				
Health and quality of life	Soft urban design for living	0,8			
	High stress causes of disably	-0,9	Low stress working conditions	0,8	
			Tax for medical care	-0,6	
	Cost per day in	0,7	Good insurance recover	0,6	0,85
	Well -Being patient	0,7			
	Physical state of body	0,9	Missing days for medical care	0,7	0,75
	Disably Life years	0,7			
Gross national happiness	Easy access to medical care	0,9			
	Good basic public education	0,8	Good basic public education	0,8	0,99
	Smart individual life and behaviour	0,75	Smart professional life and behaviour	0,8	0,85
			Good prof continuous education	0,6	
	Consuption and services facilities	0,9			
	Sustainable socioeconomic devt	0,75	Sustainable socioeconomic devt	0,8	0,85
Human development	Good literate public education	0,8	Good literate public education	0,8	0,99
	Ratio of skilled citizens	0,7	Top professional skills	0,8	0,8
			Top interpersonal management skills	0,9	
	Climate and environment	0,9			
			Good evaluation of competencies	0,8	
	Per citizen cultural spend	0,8			
	Available cultural facilities	0,9			
	world class research/education	0,8			

Table 1. Similarities of Qol between political system and entrepreneurial system

I can confirm that these results validate our qualitative observations in the field of societies and inside the towns, small cities and countries. Indeed we had difficulties to separate data from the customer/citizen voices because they always told us their personal stories which were commonly presented to us with mixed pictures from personal professional and public life. For example, when they spoke of their global wages and incomes, they always present

their salary as a unique and fundamental resource to pay at the same time and in the same way all their costs of life in the firm in the town and in their home. Driving the same approach further in this research, we propose to continue without segregation between the political system and the entrepreneurial system. The Quality of life can be analysed with the same principles among the studies with Markov systems, regarding the only difference which appears on the theoretical extreme states and cross reverse processes of the Markov system vocabulary concerning the management styles in the firm. I propose a scheme here after:
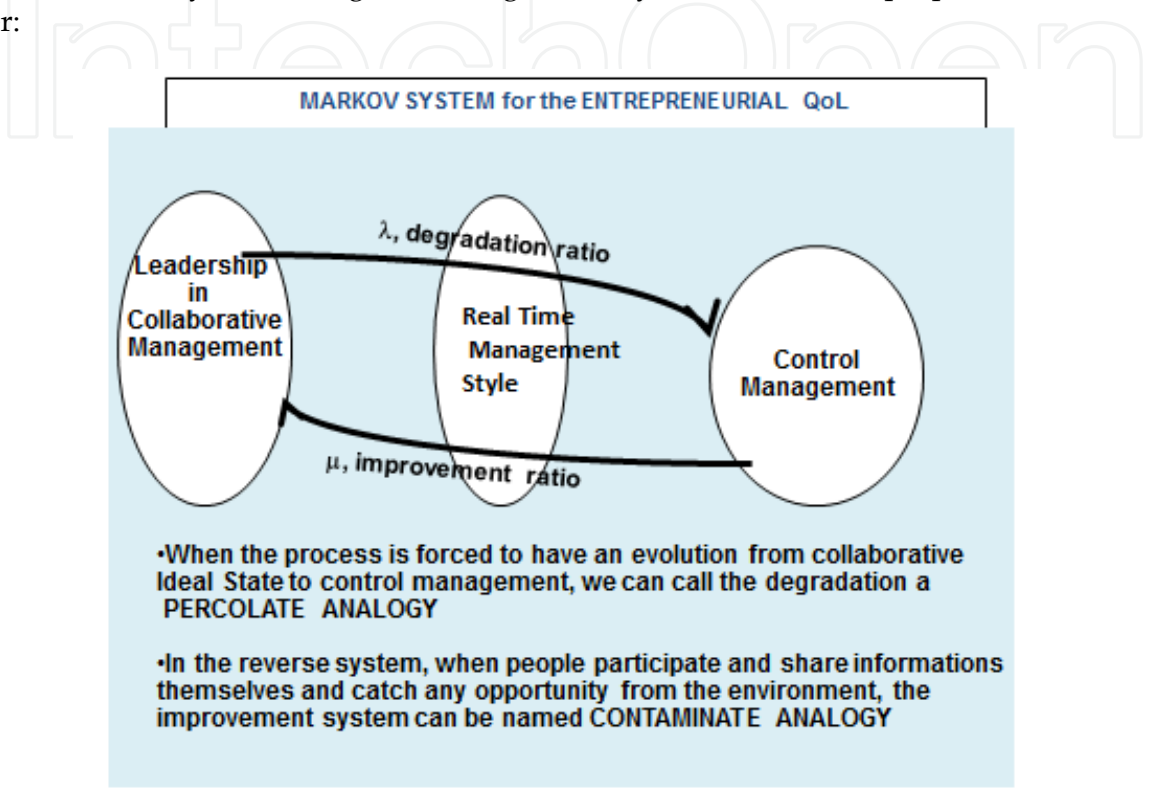

Fig. 6. The vocabulary proposed for the Markov system in the entrepreneurial case

This study allows me to validate a strong analogy between the entrepreneurial area and the political area regarding both the whole concept of Quality of Life and all the attributes of QoL. This validation confirms the assumption which was announced at the beginning of our research works: it is relevant to consider that the QoL concept has the same sense in both the entrepreneurial area and the public political area. This result conducts the study to do analysis without regarding any difference between these two areas, so I present the further parts of the text examining QoL concerning both the entrepreneurial or political systems or mixed together.

I can propose the major results of the citizen's survey structured with the Kano (Kano) method from the same data panel which was used in the part just before. So the semi-direct interviews which we have made with the employees of the company were secondly used to establish the best questions seen by the people whose we interviewed. These data were structured and proposed in the Kano questionnaire.

In this application the research context and general proceeding conditions were the same than tose of the 3.0 chapter previously described.

The results, from questionnaire's returns, are presented here after in per cent part of a panel of more than 600 client answers at each question. They have been already presented in a journal bur with a unique focus on the political aspects. As the data have common parts with our data coming from the enterprises which part is taken with confidential constraints, we can offer here after the same tables that we published concerning the only political part. As we presented before in this text, the validation is not false because the QoL concept and its attributes are similar in the political and entrepreneurial contexts, and the data came from the same panel of interviewed people.

	A	P	O	I	C	D
Q1			44,4	11,2		44,4
Q2	77,8					22,2
Q3	44,4			11,2	11,2	33,3

A=attractive, P=proportional, O=Must Be, I=indifferent, C=Reverse, D=questionable.

Table 2. Kano answers classes to three questions

Q1 is a question about environment protection respected by State and companies. It comes with under – questions on air and water pollution, environment standards respect, and innovations for cleaning the production process. We can see that Q1 is a Must Be concept of QoL.

Q2 is a question about better individual incomes allowed by CEO and politicians. It comes with under – questions on salaries in companies, retirement cost and health cost, and better life at work with a lower stress level. We can see that Q2 is clearly an attractive concept of QoL.

Q3 is a question about individual liberty and good education. It comes with under – questions on autonomy with thinking and speaking liberty, better education programs in schools and universities, and better relation between education programs and professional capacities needed in companies. Q3 is also attractive. On the figure after, we can see the Kano answers to positive and negative under questions (A to C):

Customer Needs →		Unfunctioning				
↓		1. I Like	2. It is Normal	3. No Opinion	4. I can live with	5. I do not Like

Functioning	1. I Like	D
		A2-A3-A4-
		A6-B4-B5
		C3-C4
			A
			    C7
				A
				    B6-B87
					A
					    B1-B2-B3
					    B7-B9
						P
						    C1-C2-C5

	2. It is Normal	C	I
			    C8
				I	I+
					    C97
						O
						    A8

	3. No Opinion	C
		    A7
			I	I	I	O
						    A1-A5-A9

	4. I can live with	C	I	I	I	O
	5. I do not Like	C	C	C	C	O C6

Table 3. Corrélation table between positive and negative answers to Kano questions

On the table upper we can see how the answers are positioned. This is an example of partial calculation from nine citizens - customers (A1…A9) of the same service provided by one society. This extraction of the Kano returns shows confusion between the concepts, and during the "One – On – One" interviews of the "voice of the customer" method we were allowed to observe exactly the same confusion phenomena which I detailed in the theoretical approach, between QoL, well – being, happiness, health, and political future.

4.2 QoL concept's validation in the health field

Here after we can offer the particular results in the case of the customer's, citizen's and health expert's perception of Quality of Life. Such information stays in our data base from the study ordered by the company specialised in the production of pills and health services. As there is a confidential constraint, I offer the public part of the results which are closed to our observations from the company's clients, but I precise the research context and design after the table:

	Coefficient	Standard error	Statistic Value
GDP per person	0.00003	0.00001	3.5247
Life Expectancy	0.0448	0.0106	4.2299
Political Freedom	-0.1052	0.0561	-1.8749
Job Security	-0.0217	0.0099	-2.2062
Family Life	-0.1878	0.0640	-2.9349
Climate and Geography	-1.3534	0.4691	-2.8852
Political Stabilit	0.1519	0.0520	2.9247
Gender Equality	0.7423	0.5428	1.3676
Community Life	0.3865	0.1237	3.1255
Constant Statistic Value	2.7959	0.7890	3.5435

Multiple R: 0.919
Adjusted R square: 0.823
Standard error: 0.482
Nb observations: 74

Table 4. Global importance of QoL attributes (The Economist Intelligence Unit)

The research context is closed to the previous one, but I give more details as under:

- Interviews and Kano validation made on some 40 professional (all clients of pills makers) and 90 citizens;
- The survey on professionals has been deployed on 25 veterinaries and 15 infirmaries and hospitals;
- I drew myself the survey as co-project manager beside the internal product/service manager of the pill makers, and made a training phase to the members of the companies until they were able to practice interviews and Kano validation.

Composant's weight in QoL	Eco Survey	QoL Index
Material wellbeing	11.5	18.8
Health	15.0	19.0
Family relations	14.3	11.3
Job security	11.9	7.7
Social and community activities	10.9	12.2
Political freedom and security	25.3	26.2
Gender equality	11.1	4.7
	100.0	100.0

Table 5. Weight of different components of QoL (The Economist Intelligence Unit)

I can present here after an extraction of the world wide survey made by governments up on the QoL of the 111 countries concerned:

	QoL	Rank	GDP/person	Rank	Rank gap
Ireland	8.333	1	36.79	4	3
Switzerland	8.068	2	33.58	7	5
Norway	8.051	3	39.59	3	0
United States	7.615	13	41.529	2	-11
Canada	7.599	14	34.15	5	-9
France	7.084	25	30.64	18	-7
Germany	7.048	26	28.25	21	-5
Slovenia	6.986	27	21.892	28	1
United Kingdom	6.917	29	31.15	13	-16
China	6.083	60	6.27	74	14
Nigeria	4.505	108	960	110	2
Tanzania	4.495	109	672	111	2
Haiti	4.090	110	1.47	107	-3
Zimbabwe	3.892	111	1.5	106	-5

Table 6. Worldwide quality of life index, U.N.

Reading these data and this presentation of the results a question came. Indeed, knowing that the person participating to the customer's/citizen's survey are also customer and citizen, the questioning and Kano return checking probably are concerning the people classes at random. So I can think that they have a great probability to be in the same being and behaviour. I can ask why they so much are concerning with reasonable, stable and poor

factors like GNP, material well-being, security. I can deplore the lack of positive and dynamical aspects such as risky personal projects, brightness in daily life.

5. Conclusion

In a theoretical first part I described the usual confusion made by customers and citizens on Quality of Life. I observed the misperception with its components like health, well – being, happiness and physical aspects of life. These mix-up definitions are confirmed with the customer and citizen surveys which we made with the company's employees on the global QoL perception. The validation has been made on health approach in enterprise seen by final users of medicines, with interesting links to the similar confusion in the management area in the society. The first part analyses the efficiency of the Markov model twined with the aggregation method to calculate and measure the Quality of Life. The second part analyses the opportunity and the effectiveness of the analogy in the enterprise's governance context. The same confusion between Quality of life, well – Being, happiness is validated with sustainability and governance, allowing the Markov model to present and value the dual reverse dynamic process between these concepts.

The validation made from the application which we can observe shows that the citizen's perception of QoL, and customer perception of QoL in the enterprise and public fields, offers some information:

- Confusion between the concepts (QoL, happiness, well – being, health) in the same way which explained in the theoretical part;
- Difficulty and inaccuracy of the direct measurement of global QoL in the case of a good research approach with a good reliability;
- the same ambiguity and inaccuracy about each attribute of the QoL, as positioned under QoL in their roots representation together, with a very good reliability and with sense;
- It is useful to firstly calculate the intermediary process of sustainability, and in a same calculation the safety one, from the detailed attribute's measurements, with the aggregation method;
- This is finally necessary to calculate global Quality of Life from the sustainability and the safety processes with a Markov calculation model.

I had the opportunity to make a study of the multitude of attributes elaborating the Quality of Life and interfaces between each of them in the governance area, particularly on the management activities in some enterprises. This allows me to make a complete analogy between the political system and the governance concept, with the same observation of the necessity to get better measurement of global QoL. It was useful to determine the exhaustive list of concepts included inside the sustainability spirit, like health or Quality of Life. Such emergence allows me to validate the analogy between the political system and the governance concept, conducting also further research works about the complete evaluation of Quality of Life and the better calculation of the global sustainability with the Markov model. As I validated the calculation model from the attributes of sustainability to the global governance system to be similar than in the political system case, I can have an interesting result of the Markov model in the governance context: the calculation of the percentage of real position of the existing governance system between two extreme opposite situations.

This Markov structuration for the management, studied as a particular focus in the enterprise of the governance Markov model for the political system, is interesting for further research woks. Particularly the basic description of the management system which was made on this study comes to describe the large diversity of management systems between two extreme and marginal cases which are the bad one (total control with percolated entrepreneurial values towards employees) and the good one (democratic participative collaboration with contamination by the pollen of the individual values) could be studied with much more reliability. It would be relevant to examine the correlation between the structure of the organisation in a company, the management style of the board, and the Quality of professional Life of the employees. Our laboratory can offer some complementary data on this study coming from the organizations which we observed, but it would be interesting to do special surveys of several hundred of societies in different economic areas to perform a reliable study.

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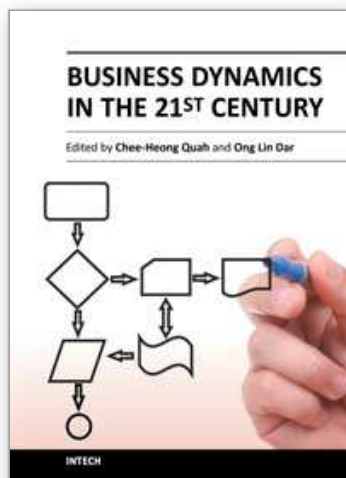
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