

Document 10.4.1.

Animating the Representation of Europe:

Visualizing the coherence of international institutions using dynamic animal-like structures

This paper, prepared by Anthony Judge, Assistant Secretary-General of the UIA, resulted from discussion at a conference on "Redesigning Europe in the Third Millennium: a New Sustainable Vision of Democracy" (Budapest, May 2004) organized by Eurovisioning.org. It was presented to a Renaissance Europe meeting on Synergies for the Well-being of Society (Brussels, June 2004) – "a project to put Europe in motion again". The on-line version of this paper can be found at <http://www.laetusinpraesens.org/docs00s/anima.php>. See also document 10.4.2. in this volume.

Introduction

The following proposal derives from work at the Union of International Associations (UIA) on the representation of complex clusters of numerous entities – whether international organizations, world problems, strategies, human values, or others. The networks of such entities are currently extracted from databases in response to user queries and displayed over the web in "spring maps". The user can manipulate: these maps: increasing or decreasing complexity, changing colours, accessing a particular database profile, etc. These spring maps are based on a Java application developed for the UIA by Gerald de Jong of BeautifulCode (Netherlands).

In the case of international organizations, the focus of the UIA initiative to date has been on representation of **inter-**organization links in such spring maps. This visualization work was funded within the framework of the EU Fifth Framework Info2000 programme. The problem in the case of the complex of institutions of the European Union is to extend this to the representation of **intra-**organizational links – and to relate such

links to the guiding principles and values that it is expected will be defined by the European Constitution, for example.

The following proposal was inspired by another web-based spring map Java application, called SodaConstructor, developed independently by Ed Burton of SodaPlay – the project of a London-based company called Soda Creative Ltd as part of their research and development process.

The proposal considers the possibility of importing organizational data into a web application, as is done in the UIA case, and animating it as a model as is done by SodaConstructor.

The idea for the above proposal arose during the course of participation at a recent conference on "Redesigning Europe in the Third Millennium: a New Sustainable Vision of Democracy" organized by Eurovisioning.org (Budapest, May 2004). In response to a presentation on *Using Research in the Participative Orchestration of Europe*, participants approved the idea of exploring the use of visualization and sound.

Box 1: Value of Soda-type Animations

Soda combines an arts and research practice with a broad range of commercial activities. A freehand animation package, Moovi, has also been developed. SodaConstructor has received considerable attention world wide and continues to attract many users. Its most interesting models, notably by Kevin (Kevin Okada), have been the subject of exhibitions. Soda has recently launched a new sound version of SodaConstructor, entitled SodaConstructor betasound. which uses the so-called jsyn plugin to enable Sodaconstructor to create high fidelity stereo sound in conjunction with animation movement. A 3D version of SodaConstructor is also under development.

A desktop version, SodaConstructor local (installed using Java Webstart), can export and import models in XML format to and from a local file system and, once installed, allows the user to play with them without re-connecting to the internet. Users have a choice as to whether they store their models online on the Sodaplay server or offline on their local computer. Sharing a model online involves either sending it to the SodaZoo or posting it in the SodaForum. Users need to be online to login into a SodaPlay account to save it on the SodaPlay server. Some users develop their own independent interfaces to facilitate construction of models.

SodaConstructor is a freely accessible Java technology-based online construction kit that gives players the ability to build interactive creations using limbs and muscles. By altering physical properties like gravity, friction, and speed, curiously anthropomorphic models can be made to walk, climb, wriggle, jiggle, or collapse into a writhing heap (see description of underlying physics). A SodaZoo has been built up, where a large and active worldwide community of sodaplayers has placed a strange and diverse menagerie of SodaConstructor models. Under funding from the UK National Endowment for Science and Technology and the Arts (NESTA), SodaPlay is currently developing SodaConstructor and related software into a flexible toolkit to deliver creative learning and fun to schools in the UK.

Challenge of "soullessness" – beyond the "pillar-ization of Europe"

The European Union, like the United Nations, is faced with an increasingly dramatic problem of being perceived as irrelevant by the electorate – however meaningful are their mandates in principle. In this respect it is useful to contrast:

- **European Parliamentary elections** (June 2004): 155 million people out of the EU's 350 eligible voters elected 732 MEPs in the European Elections, giving a participation figure of 45.5 per cent for the EU as a whole.
- **Eurovision Song Contest** (May 2004): Audience ratings for the 49th Eurovision Song Contest (ESC) broadcast over the Eurovision network had an average market share of 50% in the majority of the participating countries – more than a 50% increase on the average 32% annual market shares of EBU Members. The EBU supervisor indicated: "They show that the recent changes to the concept of the contest can generate momentum and even stronger interest for this live TV programme which has been with us for nearly 50 years." Over 5 million calls and SMS votes for the 10 minute voting windows at the end of the Semi-Final and Final combined, were processed by the first ever pan-European mass televoting platform.
- **European Football Cup** (June 2004):

A fundamental issue is the perceived complexity of such institutions, which makes them effectively incomprehensible to many – and even to government delegates to any parts of those institutions. The challenge is well-articulated by Timothy Garton Ash (*This is Our High Noon*, Guardian 24 June 2004):

The institutional arrangements codified in the [European] constitution are but a means to create those means. Is there a thinking man or woman alive in Europe who is not depressed by the prospect of spending yet more years of bad-tempered debate on such mind-numbing details? There we shall be, the so-called "opinion-formers", squabbling over contorted paragraphs and wrestling with tabloid shibboleths. Meanwhile, as the huge abstention rates in the European elections just showed, those whose opinions we are supposed to form have long since switched to another channel, to watch the football... Who

can blame them? The constitution that emerged from the Brussels summit last weekend is not an inspiring document. It entirely lacks the simplicity, clarity and political poetry of great constitutions.

Conventionally the structures of such bodies are described with organization charts, complemented by checklists and frameworks of their guiding principles and values. The latter are frequently represented through architectural metaphors, such as "pillars" supporting the structure as a whole. "Pillars" are recognized as one of the main features that makes the European Union complex and difficult to understand. Different decision-making rules apply to each of the three pillars: matters such as commercial, social and environmental policy. The draft constitution will make the differences between the pillars less noticeable but will not merge them completely. Examples of the use of "pillars" are given in Box 2.

In June 1991, for example, those involved in the EEC Commission efforts to articulate the new treaty details for European economic and political union were clarifying alternatives using code words including "pillars", "hats", "temples", "trees" and "ivy". The pillars were separate chapters of the treaty, the hat was the prologue creating a European union embracing three pillars. The alternatives were described in a "temple-versus-trees" debate in which the Commission argued that the treaty should look more like a "tree trunk with branches" than a "shaky temple supported by pillars". Others criticized a revision as "pillars covered in ivy", namely with largely cosmetic changes (*Independent*, 17 June 1991). The Helsinki Final Act (1975) was organized in terms of three "baskets" of concerns:

- Basket I includes security, human rights and freedoms, the principle of coexistence, the pledge that frontiers should be changed only by peaceful means and that states should cooperate and refrain from intervention in the internal affairs of other nations.
- Basket II deals with economic, technical, and scientific cooperation, problems of trade and environment.
- Basket III deals with human contacts - emigration rights, cultural and educational exchange, free movement of people and information.

Box 2: "Pillar-ization" – use of "pillars" in international institutional discourse

- All democracies have **two essential pillars**: some rights and obligations that constitute the Citizens? Statute and some authorities elected freely and democratically which are organised on the basis of the principle of the division of powers.
- In Community parlance people often refer to the **three pillars** of the EU Treaty. The European Union was created through the Maastricht Treaty in 1992 (EU Treaty). This Treaty has since come to symbolise the political roof resting on three pillars.
 - The first pillar consists of the two remaining European communities, the European Community and the European Atomic Energy Community (Euratom).
 - The Common Foreign and Security Policy forms the second pillar, and
 - Police and Judicial Co-operation in Criminal Matters the third.
- The EU is also described as consisting of **four pillars**:
 - Economic and Currency Union
 - Common Foreign and Safety Politics
 - Justice and Interior Politics
 - Common Defense Politics
- The Maastricht Treaty was based on **four pillars**:
 - social policy,
 - EMU,
 - justice,
 - common defense policy
- The EU's enlargement policy that has evolved since 1989 is built on **four pillars**:
 - clear political and economic criteria requiring candidate EU accession countries to respect democratic principles and to operate market economies;
 - pre-accession aid programmes to help close the wealth gap between the enlargement candidates;
 - encouraging institutional changes in the accession candidate countries so they can apply and enforce the full range of EU laws;
 - Treaty changes to ensure that, after enlargement, the functioning of the EU's institutions is not handicapped by the accession of a large number of new Member States.
- The EU Social Policy and EQUAL (EU strategy promoting new practices in the fight against discrimination and inequality) operates within 8 themes directly linked to the **four pillars** of the European Employment Strategy (EES) (plus a ninth covers the specific needs of asylum seekers):
 - Employability,
 - Entrepreneurship,
 - Adaptability, and
 - Equal Opportunities
- EU Common Fisheries Policy has **four pillars**
- EU Common Agricultural Policy rests on **four pillars**:
 - a single market with the free circulation of goods;
 - uniform prices;
 - a common preference for European products over imported ones;
 - financial solidarity between Member States as regards expenses incurred in implementing the CAP.
- The European Commission consultation on youth has had **four pillars**:
 - young people,
 - Member States,
 - youth researchers and
 - civil society (called for by Youth Forum)

- The European Court of Auditors (ECA) bases its analyses on **four pillars**, including:
 - an examination of supervisory systems and controls,
 - an analysis of declarations by director generals, and
 - an assessment of the work of other auditors.
- **Four pillars** of the European Security and Defence Identity (ESDI) A Commitment by the European Nations, Organizing for Crisis Management, Defense Resources, A Strong European Defense Industry
- The UN Mission in Kosovo (UNMIK) which brought together **four pillars** under UN leadership:
 - Humanitarian Affairs under the responsibility of the UNHCR,
 - Civil Administration of the UN,
 - Democratisation and Institution-building of the OSCE, and
 - Economic Reconstruction, Recovery and Development of the European Union (EU).
- The new partnership agreement between the European Union and the ACP countries (Cotonou, 2000) is based on **five pillars**:
 - ongoing political dialogue,
 - involvement of civil society,
 - poverty reduction,
 - new trade framework,
 - reform of financial cooperation
- The Geneva Association (Four Pillars Research Programme), The Club of Rome (European Support Centre), and The Risk Institute (Double Helix Research Programme) joint initiative is based on the concept of four pillars:
 - the compulsory, pay-as-you-go, state pension;
 - the supplementary (often funded-based) occupational pension;
 - individual savings (personal pensions, life insurance...);
 - a flexible extension of work-life, mainly on a part-time basis, in order to supplement income from the 3 existing pillars.
- **Six pillars** of development policies (Statement on Development Policy in 2001)
 - Macro-economic support and access to social services
 - Food security and rural development
 - Trade and development
 - Regional Integration
 - Institution building
 - Transport

"It's the pictures, stupid!?"

"It is the photographs that gives one the vivid realization of what actually took place... Words don't do it. The words that there were abuses, that it was cruel, that it was inhumane, all of which is true, that it was blatant, you read that and it's one thing. You see the photographs, and you get a sense of it, and you cannot help but be outraged."

Donald Rumsfeld, US Secretary of Defence, 7 May 2004

What other challenges and possibilities go officially unrecognized, and denied, because they are only described in text?

The point might also be made that concerns have been expressed at the **soulless** nature of the European initiative (cf Joschka Fischer, Pim Fortuyn, Michel Rocard, John Loneragan). Deriving from *anima*, as the Latin term for soul, efforts to "animate" the representation of Europe could well contribute to correcting this impression.

Representation and its symbolic implications

It is clear from the above that "pillars" are a much favoured, if not dominant metaphor, governing strategic thinking within international institutions such as the European Union.

Such representations, like organizations charts, are completely static. They do not easily attract attention and offer very little appeal to the imagination. They obscure the fact that the different parts of complex structures, like European institutions, have the greatest of difficulty in acting in an integrated manner on any issue with which

they are differently concerned. To a significant degree, they are mutually nontransparent.

The pillared pantheon metaphor clearly reflects an institutional heritage dating back to the classical Greek Pantheon – and its Roman imitations – often designed as temples. In even earlier pagan periods, the pillars took the form of trees marking a sacred grove open to the elements. Pillars may therefore be considered as the calcification, petrification or fossilization of values that may remain implicit in a society struggling to rediscover a healthy relationship to the environment.

In a democracy it is important to consider how such a pillared organization of values may be perceived by others – the imperfectly consulted population. Such columned architectural edifices have been used in palace design since those early times – and also, like temples, by institutions symbolic of a connection with higher values (courts of justice, religious institutions, etc).

The challenge of palaces, however, is that they are only accessible to, and inhabited by, the few. The population tends to be "confronted" by such columned structures – which bear no relation to their own lived reality. In many cases the palaces are even surrounded by **pillared or gridded security barriers so that the population is kept outside** – perhaps traditionally as outcasts and now as those adhering to "alternative" values. It is not surprising that the population then comes to associate its view of the pantheon with prison-like structures – if only aesthetically. In fact a pillared perspective is strikingly similar aesthetically to the view from, or into, a prison cell through a barred window (see Box 3).

Box 3: Isomorphic Representation of Columned (Value) Structures



It might even be argued that a barred prison cell window offers a kind of psychological "mirror" or "shadow" of the set of values promoted and integrated in a pantheon fronted by columns. It can therefore be argued that any such strategic conceptual structure, using such a pantheon-like representation, is to some degree undermining its own efforts – especially when there is also an association of the columns with the values or principles honoured in such structures,

effectively making them the virtual "temples" of contemporary society for values as modern-day secular "gods". Just as in ancient Greece and Rome, society's values and principles are effectively honoured and institutionalized in Europe through the variety of temples elaborated as programmes and projects in response to distinct strategic priorities (social security, defence, etc). As then, the "theological" interrelationship between these structures is a challenge.

Curiously the modern use of pillars is 2-dimensional, viewed from **outside**, whereas traditionally pillars also defined and bounded the nave of a 3-dimensional temple with celebrants invited **inside** – perhaps a pointer to new uses of virtual reality techniques in clarifying any "road map" understood to be outlined by pillars as markers on the way. Perhaps unfortunately, just as traditional temples provided a setting for a podium from which celebrants were inspired regarding "good" and "evil", modern value structures evoke the need for the population to be exposed to lectures from conference podia about the positive and negative values associated with the pillars.

Again modern representations struggle to give form to the "roof" that pillared values are designed to support to protect those within from the elements. The roof may effectively be defined by the pillars – although in practice the set of pillars may even be deliberately "roofless", like the pagan temples of the distant past. This relates curiously the circle of stars that is basic to the design of the European flag:

It is the symbol not only of the European Union but also of Europe's unity and identity in a wider sense. The circle of gold stars represents solidarity and harmony between the peoples of Europe. The number of stars has nothing to do with the number of Member States. There are twelve stars because the number twelve is traditionally the symbol of perfection, completeness and unity. The flag therefore remains unchanged regardless of EU enlargements.

The disposition of the stars suggests that they should be understood as a set of pillars presented in cross section defining a space analogous to those of the oldest open temples. Even the pentagonal stars recall the design of temple pillars. For example *The New English Bible* indicates that the entrance to the Holy of Holies "the door posts and the pilasters were pentagonal" (1 Kings 6:21), following on the pillar design favoured by the ancient Egyptians and the pentagonal representation favoured for the doorposts of Pythagoreans. In the Temple of Jerusalem, the pentagon was not oriented

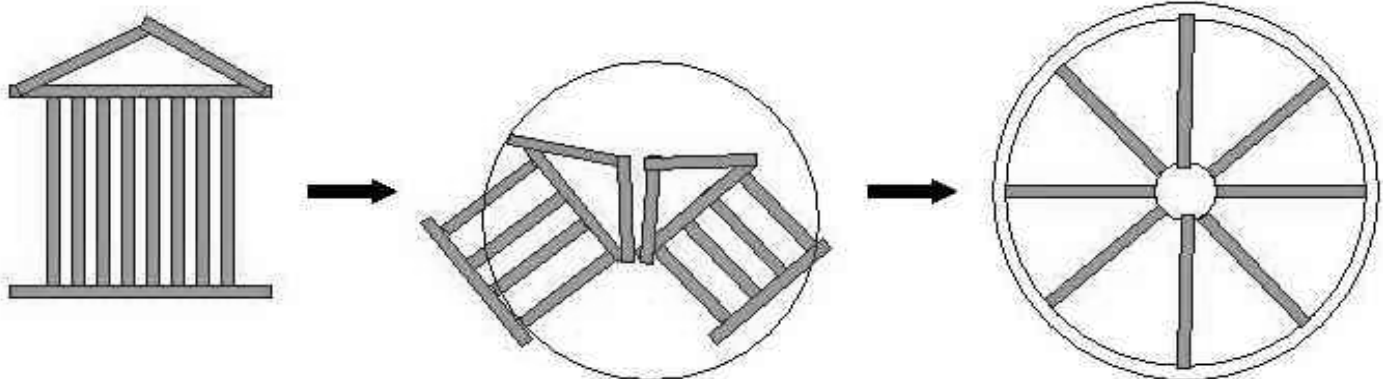
horizontally towards people, but turned upwards to heaven since the door it marked was intended for God.

Beyond impoverished metaphors

The interesting design question is whether the pillared pantheon is susceptible to fruitful modification in ways that conserve some of its valued structural features. Examples might include:

- **Pillars to Legs:** The static "pillars" could be understood as "legs" or "feet" (as in the renowned biblical *Song of Solomon* (5:15): "His legs are pillars of marble"). This then suggests reflection on how the legs might move in a coordinated manner in relationship to one another in order to move the whole. In this sense an institution might also be perceived as "walking" or "running" (rather than standing still) – by coordinating the priorities successively accorded to values or principles in relation to one another. Note that organizations, projects and meetings are frequently said to be "run" or to "run well" over successive reporting periods.
- **Pillars to Spokes:** The base of the pillars, like the top, are typically joined together in any representation. The pillars might then be considered as spokes – provided the base rises at each end around the construction as a whole to form the circumference of a wheel (see Box 4). The connected tops of the pillars then create a "space" which may be understood as the hub of the wheel. Indeed "hub" is used as an indication of a core locus of decision-making. Clearly a wheel tends to have the capacity to roll, carrying a load in some direction. A common expression with respect to institutional initiatives is the expression "let's roll". From some cultural perspectives – in addition to the "rose windows" of Christianity – a wheel is a common device for the organization of fundamental values (Buddhism, Hinduism, Taoism, etc).

Box 4: From Pillars to Wheel Spokes



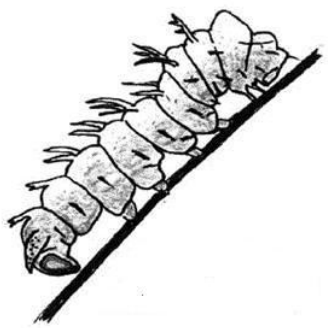
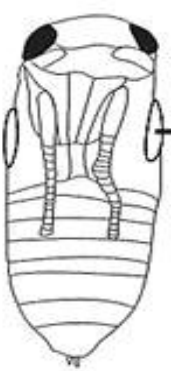

- **Caterpillar to Butterfly:** The necessary institutional metamorphosis for the 21st century has been explored by John Elkington (*The Chrysalis Economy*, 2001) through this caterpillar-butterfly metaphor from the insect chrysalis – the stage in the life cycle of lepidopterons when, within a self-spun cocoon, rapacious (and somewhat ugly) caterpillars undergo a sensational re-configuration of both form and function, to emerge as delicate (and often beautiful) butterflies (or moths if their particular genes so dictate). For Elkington, the transformation is not achieved without radical shifts in the nature of the animal that involves "self-digestion" before metamorphosis is possible. He uses insights from this metaphor to illuminate many aspects of corporate transformation.

For Edgar Morin (*Vers l'abîme*, *Le Monde*, 1er janvier 2003): La métamorphose de la chenille en papillon nous offre une métaphore intéressante : quand la chenille est entrée dans le cocon, elle opère l'autodestruction de son

organisme de chenille, et ce processus est en même temps celui de formation de l'organisme de papillon, lequel sera à la fois le même et autre que la chenille. Cela est la métamorphose. La métamorphose du papillon est préorganisée. La métamorphose des sociétés humaines en une société monde est aléatoire, incertaine, et elle est soumise aux dangers mortels qui lui sont pourtant nécessaires. Aussi l'humanité risque-t-elle de chavirer au moment d'accoucher de son avenir.

It is tempting to recognize the segmentation of the caterpillar as indicative of the partial (simpler) coordination that often prevails between divisions of a complex institution – quite different from the degree of coordination required by a butterfly. In this sense the pupal phase might be understood as that in which the static pillar-based value organization is transformed through a "renaissance" into the radial organization typical of a rotating wheel.

Box 5: Cater-pillar to Butterfly Transformation – a Renaissance

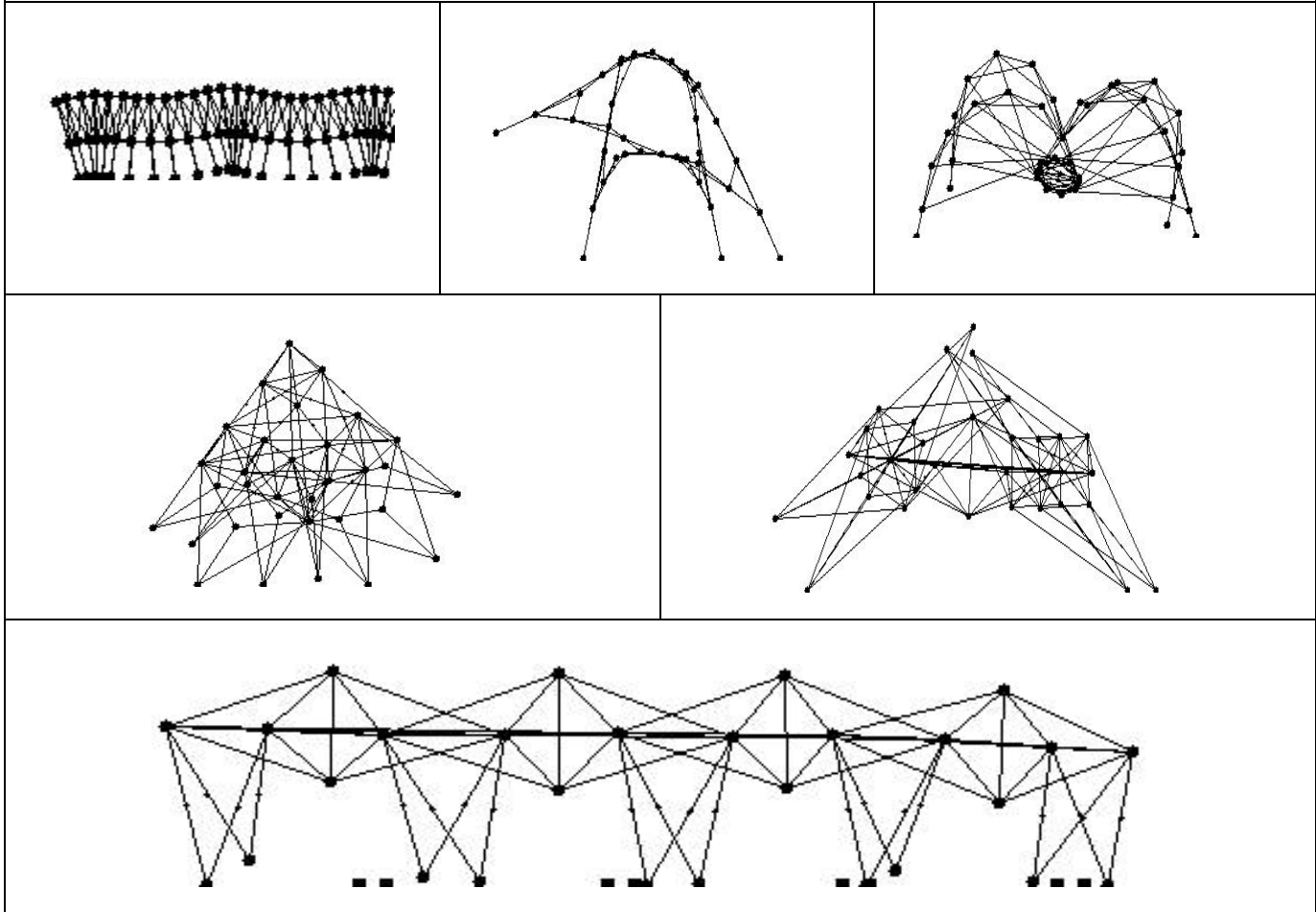
Cater-pillar	Pupa/Chrysalis	Butterfly
		

By modelling existing "cumbersome" structures and exploring their possible transformation, imaginative approaches (anchored in practical budget-line options), could be explored to ensure that an institutional system is transformed from cumbersome to elegant (from "Beast" to "Beauty"). It is such structures which would be expected to "fly" (as with a butterfly) – to employ a common metaphor for a successful project – in contrast to one that does not "get off the ground" (as when a project described as a "turkey" is contrasted pejoratively with one described as an "eagle"). *[Of course, in anticipation of any such transformation, there is a need to "cater" to a pillar-structure to enable it to reach the "caterpillar" stage ! In this sense the pillared structures of the EU (and UN) may correspond to the static "egg" stage in the lifecycle – from*

which the caterpillar emerges – then to become a pupa (chrysalis) before the adult butterfly then emerges].

The basis of this proposal is that there is a unique opportunity to render such institutional structures more meaningful and appealing by using dynamic representation techniques that have the recognized communication strengths of animation. The success of SodaConstructor in attracting millions of users at all levels of society is an indication of the creative potential of such tools. The success of the UIA in holding thousands of organization elements in large relational databases, and displaying them in interactive maps, is an indication that operational significance can be given to such maps.

Box 6: Examples of multi-legged animated Soda models



Proposal for dynamic representation of institutional budget lines

The elements of the proposal are as follows:

- **Static "pillars"**: Political discussions in the EU focus on a limited number of "pillars" (from three to six) of principles that provide a pantheon-like base to hold up a common roof. The pillars may be values, principles, chapters in a constitution, or institutional elements. These features are primarily meaningful and interesting to those reconciled to the legal language in which they are formulated. It is extremely difficult to portray such conceptual structures in a non-tedious manner to an increasingly young electorate in an increasing range of languages.
- **Dynamic models – from "pillars" to "feet"**: Amongst the many examples in SodaConstructor's SodaZoo, it is possible to find animal-like models that have been constructed with four or more "feet" enabling them to move. Through such animations the static "pillars" are transformed into "feet". The feet move in a necessarily coordinated manner in relationship to one another in order to move the whole. This is a very suggestive image for a Europe "on the move" – in contrast to one which is

portrayed as static and with an implicit rather than explicit dynamic.

- **Movement – using institutional "muscles" (instead of "pillars" and "baskets")**: Animal-like movement in any representation of an institutional complex offers a good beginning to thinking about the modality and direction of movement of the EU (or the UN) as a whole. Some 30 different types of locomotion have been distinguished in animals, and it is not unusual for an animal to change from one type to another (i.e. from walking to jumping in a given period of locomotion) [see gait analysis resources]. Movement challenges the imagination at every level of society to raise good questions about what **alternating adjustments** are required (in successive budgetary cycles) in a complex structure to enable it to move – in contrast to a situation in which the institution might be understood as "frozen" (or, more pejoratively, as "catatonic" or in a "vegetable state"). Such a frozen state leads to situations in which the institutions can only move "catastrophically", namely in a succession of spastic adjustments (also recognized institutionally as "fire fighting"). Such adjustments are evident in the way priorities are drastically modified at the end of each budgetary cycle – or in response to emergencies.

Box 7: Technicalities of walking

Walking is a result of combinations of contractions and relaxations of groups of muscles in a specific order. These muscle contractions and relaxations are repeated in a timely order that results in a repetition of leg motions. As the legs move back and forth, the subject moves forward or in the direction of the walking motion. Considering the number of muscles and the complexity of the way in which individual muscle groups are activated during walking, the development of such a control system is a great achievement. A good understanding of the phases of the gait cycle is required for such a technology to be successful. The left and right legs have different gait cycles and both are important during walking, especially when the control system is designed for a paraplegic individual.

The five phases of the gait cycle are: Early swing, which results in the maximum flexion of the knee joint; Late swing, which is characterized by the heel gently touching the floor; Weight acceptance, which occurs when the other leg is about to be lifted up and the body weight is shifted to the leg of interest; Mid-stance, characterized by a straight leg with the foot flat on the floor; Terminal stance, in which the body weight shifts to the other leg and the heel is taken off the floor. Because walking combines the above gait phases to produce a smooth movement, a good knowledge of when a particular phase begins and ends is necessary for the calibration of the control system. The system can be calibrated in such a way that it can skip a certain phase or combine a number of phases as necessary to adjust to the walking pattern.

Dynamic Optimization of Human Walking (Frank C. Anderson Marcus G. Pandy, 2001): A three-dimensional, neuromusculoskeletal model of the body was combined with dynamic optimization theory to simulate normal walking on level ground. The body was modeled as a 23 degree-of-freedom mechanical linkage, actuated by 54 muscles. The dynamic optimization problem was to calculate the muscle excitation histories, muscle forces, and limb motions subject to minimum metabolic energy expenditure per unit distance traveled. Muscle metabolic energy was calculated by summing five terms: the basal or resting heat, activation heat, maintenance heat, shortening heat, and the mechanical work done by all the muscles in the model. The gait cycle was assumed to be symmetric; that is, the muscle excitations for the right and left legs and the initial and terminal states in the model were assumed to be equal.

Most early static optimization studies included up to **30 muscles per leg**, whereas more recent models have used **42 or more muscles per leg**.

- **Budget line "muscle"**: Suppose now that the strings in the string map of an institutional structure represent individual budget lines, namely as the institutional "muscle" required to ensure the dynamism of the institution and its capacity to move ("more funds, more muscle"!). Major and minor budget lines would then be represented by major and minor muscle/strings. The technique allows major budget lines (muscles) to be distinguished from minor budget lines (muscles) – down to whatever detail is needed to ensure that movement is smooth (see Technicalities of walking in Box 7). The challenge for any institution is to ensure that these muscles adjust in relation to one another (stretching and relaxing) in a manner to move the whole forward in a coordinated manner. Conceptually this problem of mutual adjustment of "muscles" has been extensively studied in the development of progressively more successful algorithms to articulate animal-like movement in computer-generated life-forms (notably for movies and video games).
- **Budget line database**: Such detail could be readily pulled into a display from a budget line data base directly developed from the programme and budget of the institution. Conventional representations of organizational networks by nodes and links and descriptors (notably as defined by XML DTD's) could readily be adapted/extended to represent budget size and reporting frequency. These elements could be loaded automatically to configure suitable animal-like structures in SodaConstructor. Budgetary alternatives could be used as the basis for alternative animated figures.

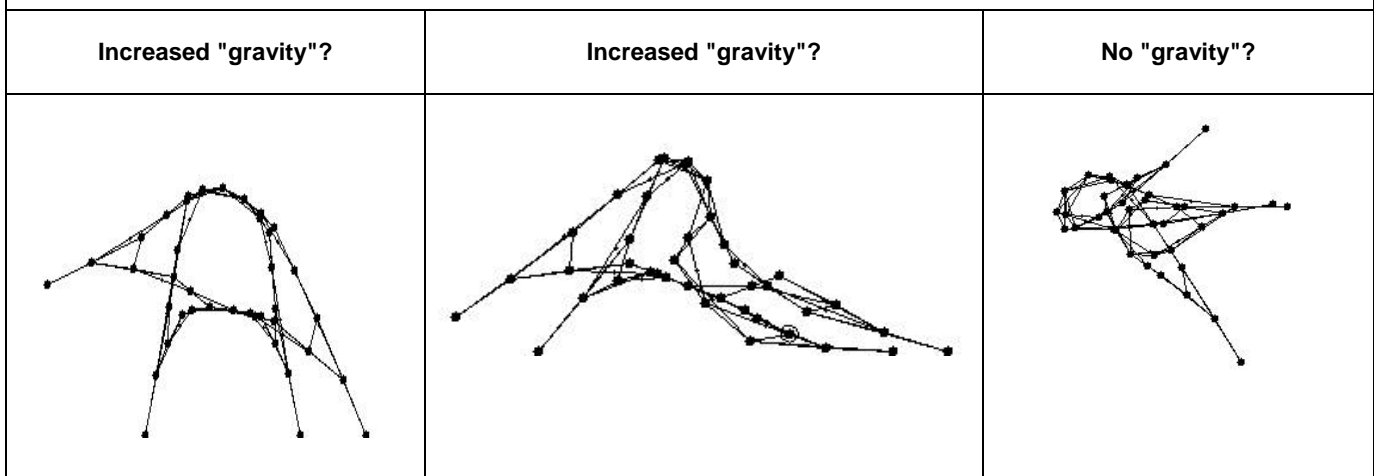
Box 8: Walking/gait abnormalities: lessons for institutions?

The pattern of how a person walks is called the gait. Many different types of gait abnormalities are produced unconsciously. Most, but not all, are due to some physical malfunction. Some gait abnormalities are so characteristic that they have been given descriptive names:

- **Propulsive gait** (characterized by a stooped, rigid posture, with the head and neck bent forward)
- **Scissors gait** (characterized by legs flexed slightly at the hips and knees, giving the appearance of crouching, with the knees and thighs hitting or crossing in a scissors-like movement)
- **Spastic gait** (characterized by a stiff, foot-dragging walk caused by one-sided, long-term, muscle contraction)
- **Steppage gait** (characterized by foot drop where the foot hangs with the toes pointing down, causing the toes to scrape the ground while walking)
- **Waddling gait** (characterized by a distinctive duck-like walk that may appear in childhood or later in life)

- **Communication relevance:** The great merit of the approach is that complex, and often dreary, options could be portrayed as a whole in a manner that is comprehensible as a whole. Such dynamic models offer a way of communicating complex notions without losing their coherence. Such communication is as relevant in policy or media briefings as it is in communicating with the electorate and those of younger age – the electorate of the future.
- **Model features:** At present SodaConstructor offers control features governing the dynamic behaviour of models. These include gravity, friction, and speed. A key question is how, meaningfully, to relate such dynamical constraints to the constraints on institutional dynamics determined by policy decisions. Tentatively, for example:
 - **gravity** might be related to relative economic costs of activity in the society: higher the costs, the lower the possibility that any budgetary amount will be as cost/effective as desired; conversely excessive funding may cause a project to go out of control (*Explore this by modifying the "gravity" parameter in model in Box 9 below*).
 - **friction** might be related to political support/opposition and proportion of vested interests inhibiting activity
 - **speed**, which takes the form of frequency in the models, might be related to budgetary or reporting cycles: this could be especially interesting if at the end of each cycle the size of particular budget lines is changed in relationship to others (flexing and relaxing of muscles essential to movement). This is especially significant since the different projects might have shorter or longer budget cycles – to be represented in the model by contraction or relaxation of distinct muscles according to different rhythms

Box 9: Institutional impact of a high "gravity" environment: non-viability? collapse?



- **Institutional development and transformation:** Possibilities of transformation could be usefully explored by starting from the existing structure, drawn as one form of animation from the database – maybe with many feet (like a caterpillar) – to determine the successive transformations required to develop a more elegant or robust structure. The approach could show the steps required to get from a "caterpillar" to a "butterfly" – preserving whatever topological invariances are essential. *[The caterpillar-butterfly transformation, articulated by Edgar Morin in relation to complexity studies, is a much appreciated metaphor in the EU policy world. But no one has endeavoured to illustrate it visually or to tie budgetary and institutional detail into the structure so that options can be intelligently considered.]*

Identification of viable transformation pathways, from one form to another, would call for development of applications using topological and other methods to ensure appropriate invariance in order to preserve identity throughout the process.

- **Institutional ecosystems:** Further possibilities lie in the recognition that the many EU (or UN) institutions could be seen as constituting an ecosystem of animal-like characters (as suggested by SodaConstructor's SodaZoo). These could move around – and interact – to give an understanding of the organizational ecosystem that determines social initiatives at this time. Constraints could be explored on their interactivity – as in artificial life simulations – consistent with their viability and sustainable development.
- **Institutional "meme pool":** More intriguingly is the value of a SodaZoo-type formula to allow participants, from the general public to specialists, to formulate an extensive array of models experimentally. This effectively builds up an institutional "meme pool" analogous to the "gene pool" necessary for animal species development.
- **Explanatory text:** A further desirable feature would be to use standard mouseover techniques to bring up explanatory text about a particular budget line/muscle, etc. There is thus a direct link from string/muscle elements of the animation to specifically named institutional units responsible for their implementation. Pointers could be provided to documents on individual budget lines (as is done with *Decision Explorer*).
- **Reframing the language challenge:** Now that the official languages used in the extended European Union have increased from 11 to 20, there is a major challenge of communicating complex structural notions to an electorate with a higher proportion of people more oriented to "Europe" as understood through the dynamics of "Eurovision" or the European football cup. Embodying options in the dynamics of comprehensible models is a strategy for bypassing significant obstacles and costs associated with translation and interpretation.
- **Sound:** The sound feature, in its early stages of development by SodaConstructor, suggests the possibility of going beyond the simple association of "jingles" with

moving models to the point of using sound and music to carry meaning. The UIA has also experimented with sound possibilities using the SSEYO Koan plug-in. Such possibilities form the basis for a new range of "auditory display" applications as defined in the ICAD/NSF *Sonification Report*.

- **Three-dimensions:** More realistic models can be constructed in 3D as the UIA has demonstrated using virtual reality (VRML) techniques during the course of a multimedia contract under Info2000. The new release of Soda's 3D facility suggests other possibilities.
- **Conversion into conventional presentations:** As with PERT and other management charting tools, the animated representations could be converted back into other conventional forms when these are preferred.
- **Policy alternatives and polarization:** A major feature of the debate on the future of Europe (or of the UN) is associated with the tendency to policy polarization (although "polar-ization" might also be usefully explored in terms of "pillar-ization" in a "pillar-ized" society). Different political coalitions favour different future models of Europe. It is very difficult to articulate these alternatives so that others can make meaningful judgements as to their relative merits. The dynamic models offer a meaningful possibility that is an intermediary between the detail of legalistic detail and the caricature of party electoral propaganda (in posters and slogans, for example). Many who appreciate the elegance of movement in sport and dance may be re-engaged by political proposals for organizations that "move" elegantly – and have "style" and "cool moves". The participatory emphasis is an added attractor in marked contrast with a elitist pillared portico.
- **Institutional pathology:** Of particular interest is the use of such models to explore dysfunctionality as defined in terms of coordination problems and muscular atrophy, dystrophy pathology, and neuromuscular disorders – to the point of paraplegia. Such models might offer new insights into institutional "health" – "fit" and "lean" organizations in contrast with "over-weight" and organizations threatened by "obesity".
- **Simulation:** Such models can be constructed:
 - as representations of existing structures – for communication purposes – in a public relations effort by official institutions,
 - as imaginative representations of what future European institutions might be – as creative brainstorming exercises by students and interested groups (NGOs, lobbying groups, etc). This could augment the scope of participatory democracy by involving groups in a participative (open source) design process that results in very specific suggestions succinctly presented. The ludic initiative by SodaConstructor to enable a SodaRace environment in which models can be be "raced" – recalls the early efforts in which simulations were tested by competitive confrontation. Sodarace is an online olympics pitting human creativity against

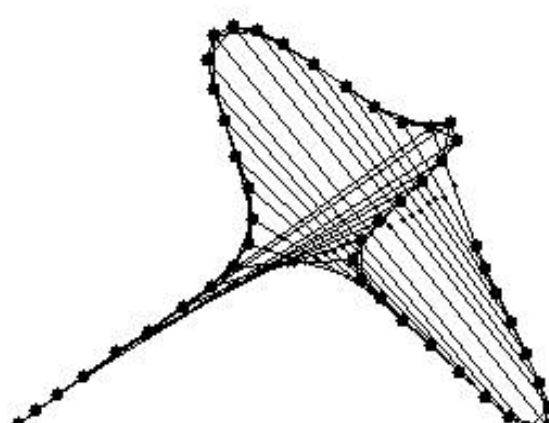
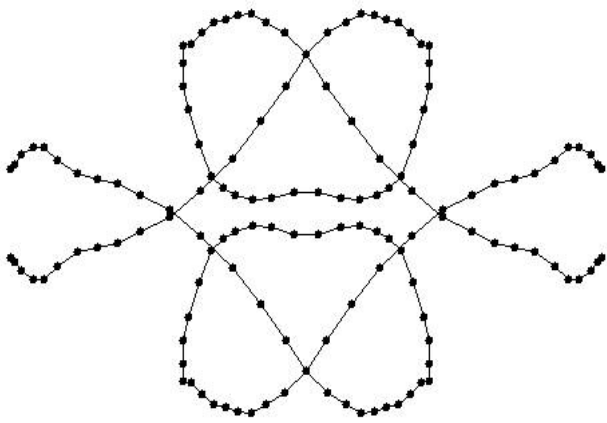
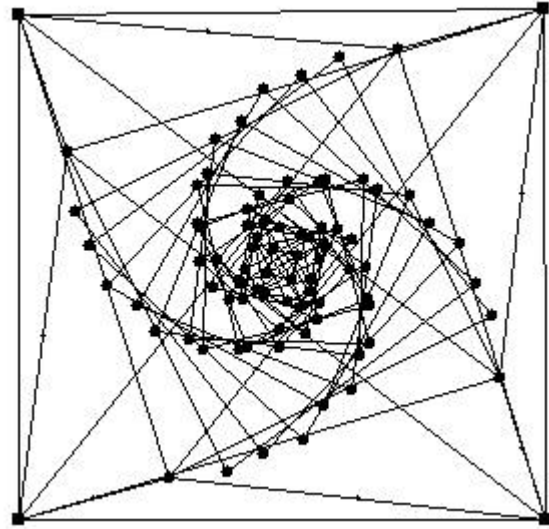
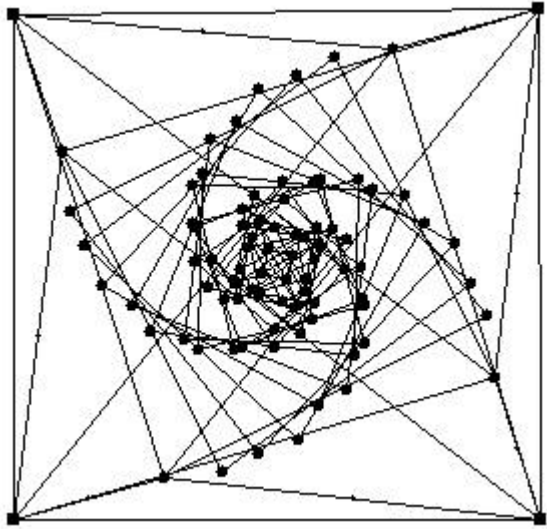
machine learning in a competition to design models that race over 2D terrains.

- as primarily creative exercises by design and other groups focused on interesting constructs – not necessarily related to current political realities, but raising valuable questions as to what kinds of institutions might hypothetically function with that kind

of structure. This research could embody work from artificial life studies, notably in relation to virtual environments.

- as design spaces for those seeking to articulate the organizational structures and processes for alternative patterns of living and community

Box 10: What might the dynamics of an emergent multi-organizational "butterfly" look like?
(including models by Kevino: Love, *BuggerFly*, *Xenomorphius*)



Conclusion

It is most doubtful whether "Europe" itself (or the "United Nations") can be "re-animated" without re-animating the representation of "Europe" – for the benefit of those whose highest values are represented by it.

Using a modelling kit as described, models could also be constructed as simulation exercises by policy research institutes to explore the consequences of: (a) different budget line policies, (b) alternated in different ways, and (c) over a period of time. Such research could shift the focus from particular policies at particular times to the challenge of how the balance of policy options needs to be changed over time – to keep the institution moving, to keep it balanced in that process, and to prevent it collapsing. Seen in this light, the different "pillars" could be shifted from the elephantine to the elegant, and possibly nimble, as required by rapid response to turbulent and changing circumstances (see, for example, Rosabeth Moss Kanter. *When Giants Learn to Dance: Mastering the Challenges of Strategy, Management, and Careers in the 1990s*, 1990).

More interesting is the possibility that political alternatives may actually represent different configurations of sets of institutional muscles – corresponding to different stages in the process of movement. Models could in this way be used to hold dynamically seemingly incompatible alternatives (eg putting the "right" political leg forward rather than the "left", or vice versa). The policy alternatives may then prove to be a matter of timing in a larger context essential to movement. Such alternation is of course, in principle, a fundamental feature of the checks and balances of the democratic process.

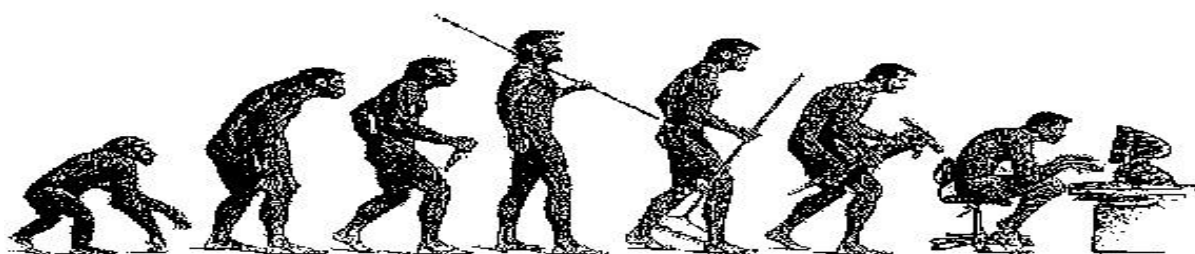
Animation, as proposed, may then clarify when an institutional initiative is likely to become unstable or collapse – and what dynamic makes for stability.

More complex examples all raise questions as to whether such unusual structures might possibly model institutional initiatives of any value to society, and if so under what conditions? Furthermore they raise questions of the significance that particular structural features might have in practice. What would be required for a European initiative to "fly" – like a butterfly, for example? What institutional significance might be attached to a rotating wheel in which "feet" were linked to form its spokes? Etc?

Such explorations raise issues about the (failure of) "mobilization" of the population in support of the European agenda. Why is there such a disconnection between pillared values and what people sense as "mobile" and motivating? Why does Europe seemingly fail to appeal to popular imagination – except through the Eurovision song contest, the UEFA football cup, or the "Jeux sans Frontières"?

Why is it that the imagination of humans is excited by (and associated with) flying – and perceives institutions as "plodding", if not "static"? Does this indicate the possibility that a soulless Europe can best be avoided by the organization of values and initiatives in ways somehow isomorphic with sustainable flight? Is this a reason for variously favouring the dove as a symbol of peace and the eagle as a symbol of nobility and strength – despite the consumption of the former by the latter?

Box 11: Dysfunctional Model of Institutional Metamorphosis?



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