



laetus in praesens

Alternative view of segmented documents via Kairos

10 June 2019 | Draft

Coherent Representation of the European Union by Numbers and Geometry

Mapping structural elements and principles onto icosahedron and dodecahedron

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Introduction

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Annex of *Experimental Visualization of Dynamics of the European Parliament in 3D* (2019)

Introduction

The European Union is a very complex structure. It is unclear who has clear insight into that complexity and by what means they see it as coherent. The difficulty is presumably all the greater for the Europeans who are governed by that structure and who are expected to indicate their policy preferences. The same may well apply in the case of other structures, whether international, regional, national or even local.

In the case of institutional complexes like the European Union it is therefore surprising to note that a degree of coherence is supplied through numbering parts of the structure, notably the most fundamental to their principles and strategic operations. Thus much is made of the "three pillars" and the "four freedoms", but more articulated sets also evident. Whilst such sets may be readily cited, as with "10-point Action Plans", it is unclear how thus multiplicity of numbered articulations is rendered comprehensible, and how it may be understood as indicative of the coherence of the endeavours of the European Union.

It could be said that most with any degree of familiarity with the European Union have no need of other ways of comprehending its coherence as a whole -- to which they may in practice be indifferent. The matter can be understood otherwise where attention is drawn to any democratic deficit and to the widely noted rise of euroscepticism. Of what are people sceptical if the coherence of the structure is only conveyed in lengthy speeches and wordy texts -- some extending to thousands of pages?

The following is a simple exploratory exercise to cluster the organizing and strategic principles by number -- and to associate those numbers with polyhedra which exemplify coherence. Presumably this may primarily appeal to those who are confused (and unconvinced) by lengthy speeches by important people -- and by wordy texts which they have little inclination to read. Expressed otherwise, might some such mapping enable and enhance credibility in circumstances in which it is clearly lacking to an unfortunate degree.

The procedure in elaborating the following table has been simply to locate via the web any texts associated with "EU" or "Europe" which indicated an N-point articulation (eg "9-point Action Plan"). In illustrating the process, the table is incomplete in various ways. As an exploratory exercise, it excludes:

- articulations associated with the Council of Europe, notably its conventions (structured in terms of a specific set of articles). Clearly these merit inclusion to the extent that with those of the European Union these constitute a larger institutional complex within which there are many links of relevance to the operation of both
- articulations by political groupings, lobbies and advocacy groups (proposed "Action Plans") presented for adoption by the European Union in some way (a few have been included, duly indicated)
- articulations by European bodies, independent of the European Union, primarily for their own interest groups
- articulations of a non-regional nature, most notably those of the United Nations or of the OECD
- indications in legal texts referring to numbered articles in a set (eg "Article 5")
- articulations not readily detectable using variants of the "10-point" search string, beyond "10 principles", "10 guidelines", and the like
- articulations which are not well-indexed on the web (especially if they have not been published in that way)

One hypothesis discussed in the main paper is that there is a natural preference -- governed by cognitive constraints -- for patterns of "N-foldness" of a certain size. From that perspective, this exploration considers the possibility of mapping the articulations onto several polyhedra, most notably the icosahedron and its geometric dual (the dodecahedron). Their many symmetry properties are considered significant to the memorability of relatively high degrees of complexity. A case was made in the main paper for the value of representations in 3D, especially with the rapid development of interest in the associated technology and its availability.

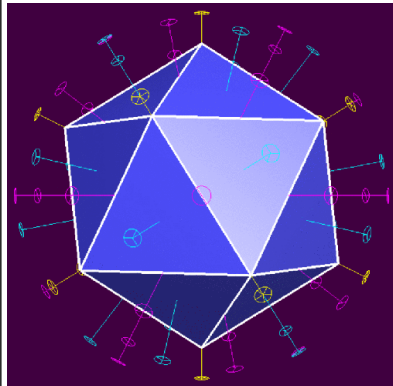
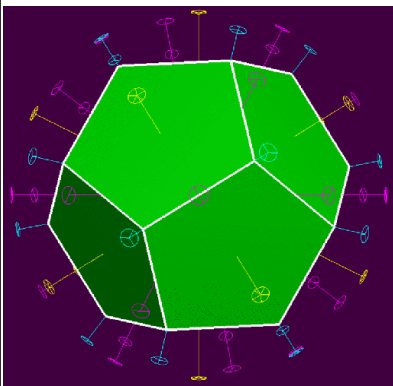
The contents of the table invite a variety of comments indicated thereafter, as with the indicative mapping onto polyhedra. Of particular interest is the manner in which equivalent "N-foldness" between polyhedra allows the representation on one to be smoothly morphed into representations on another.

Table of strategic structural attributions by number of elements

Coherent representation of the European Union by numbers and geometry					
Numbers	Structural elements of European Union	Polyhedra			
		Icosahedron	Dodecahedron	Cuboctahedron	Other polyhedra
1	Flag of Europe Anthem of Europe				
2					
3	Pillars of the EU 3 categories of European Pillar of Social Rights		3 10-fold axes	3 4-fold axes	
4	Four freedoms in Europe Four principles underlying cohesion policy			4 3-fold axes	
5	Pentagonal symbolic stars Securing the Energy Union: five pillars and five regions Five constitutional principles of EU law EU's Russia policy: five guiding principles 5 Scenarios for future of EU (white paper)		12 pentagonal faces		
6	6 Principles for further developing EU-Turkey Cooperation in tackling the Migration Crisis (2016) 6 Privacy Principles of the GDPR: data protection, for personal data processing (2019) 6 Principles of EU democracy support (2009) Sixth Scenario for the Future of Europe (2017)	6 vertex axes 6 5-fold axes	6 face axes 6 5-fold axes	6 vertex axes 6 2-fold axes	
7	Principle EU decision-making institutions 7-point Solidarity Package for agriculture (2016) 7 Principles of the GDPR (2019) 7 Guidelines for AI Ethics (2019)			7 face axes	7 Szilassi faces 7 Csazar vertices
8	8 Principles of integrated coastal zone management (2002) 8 Principles of Data Protection and GDPR (2017) 8 principles for a fair and humane approach to migration (Oxfam, 2017).				Stellated octahedron
9	9 political priorities of the Joint Research Centre 9 Political groupings in European Parliament (2018) 9-point Action Plan to increase compliance with and improve governance on EU environmental rules (2018) 9 principle underlined by social partners in European Pillar of Social Rights (2018) 9 GDPR principles relating to processing personal data (2015) 9 General Principles of EU Administrative Procedural Law? (2015) 9 principles for meaningful social innovation (2019) 9 principles to achieve quality social and health services (2019)	Embedded enneagram (main paper)			
10	EU Policy priorities (2015-2019) 10 Point Action Plan to further reinforce the European Parliament.(2012) 10 point action plan on migration (2015) 10-point plan for future relations with China (2019) 10-point plan for improving the EU's public profile (2001) 10-point plan for Industry and Europe 10-point plan for European tax justice (2019) 10 Principles for integrated child protection systems	10 face axes 10 3-fold axes	10 vertex axes 10 3-fold axes		
11	11 Common Basic Principles for Immigrant Integration Policy in the EU.(2004)				
	12-starred Flag of Europe 12-Point EU Action Plan to support the Millennium				

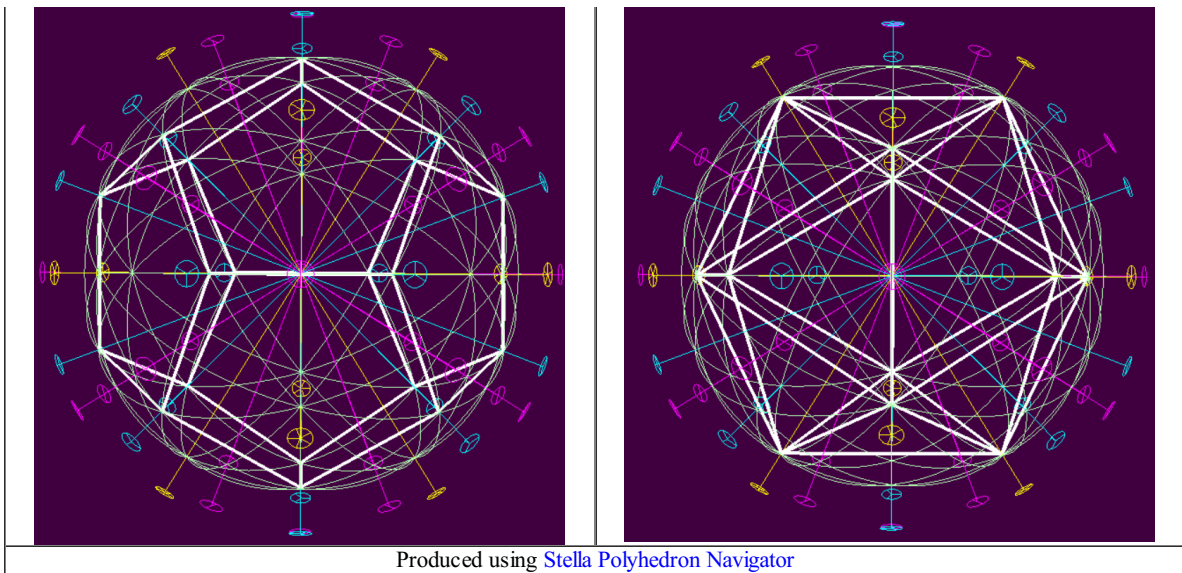
12	Development Goals (2010) 12-Point Socialists' Action Plan (European Parliament, 2007) 12-Point Plan to bring the EU close to the citizen (2017) 12-point commitment to respect the landmark 2015 nuclear agreement (2019)	12 vertices	12 pentagonal faces	12 vertices	
13	13-point Call for Action to the European Union by the European Network Against Racism (2012)				
14	14-Point Action Plan for European coastal and maritime tourism: jobs, growth and sustainability (2014) 14-Point Critical Summary: what the EU Constitution does (2005) 14-Point No-deal Brexit Contingency Plan (2018) 14-Point Humanitarian Interventions System (HOLIS reporting system to inform of new bilateral aid initiatives)			12 faces	14 Szilassi vertices 14 Csaszar faces?
15	15-point plan to make EU trade and sustainable development more effective (2018) 15-point action plan: Civil Society Dialogue on Trade and Sustainable Development (2019)	15 great circles 15 2-fold axes	15 2-fold axes		
16	16-point strategy to improve technology policies across the EU (2015) 16-point Digital Single Market initiative (2015). 16-point statement on issues of obesity, nutrition and physical activity and endorsing specific actions				
17	17-point plan of action on Western Balkans Migration Route (2015) 17-point checklist of European Local Government Workers and Employers (2009)				
18	18-point Road Map for adhesion of Bosnia (2000)				
19	19-point plan emerges from EU G8 heads of state summit (2008)				
20	European Pillar of Social Rights in 20 principles 20 General Principles of EU Administrative Procedural Law (2015)	20 triangular faces	20 vertices		
30	28 Member states (plus or minus future accessions)?	30 edges	30 edges		

Symmetry elements of dual polyhedra enabling integrated mapping

Symmetry axes of Icosahedron (animation)		Colours of symmetry axes	Symmetry axes of Dodecahedron (animation)	
	12 Vertices	Yellow = Vertex	20 Vertices	
	6 Axes		10 Axes	
	20 Faces	Cyan = Face (centered)	12 Faces	
	10 Axes		6 Axes	
	30 Edges	Mauve = Edge (centered)	30 Edges	
	15 Axes		15 Axes	
Produced using Stella Polyhedron Navigator				

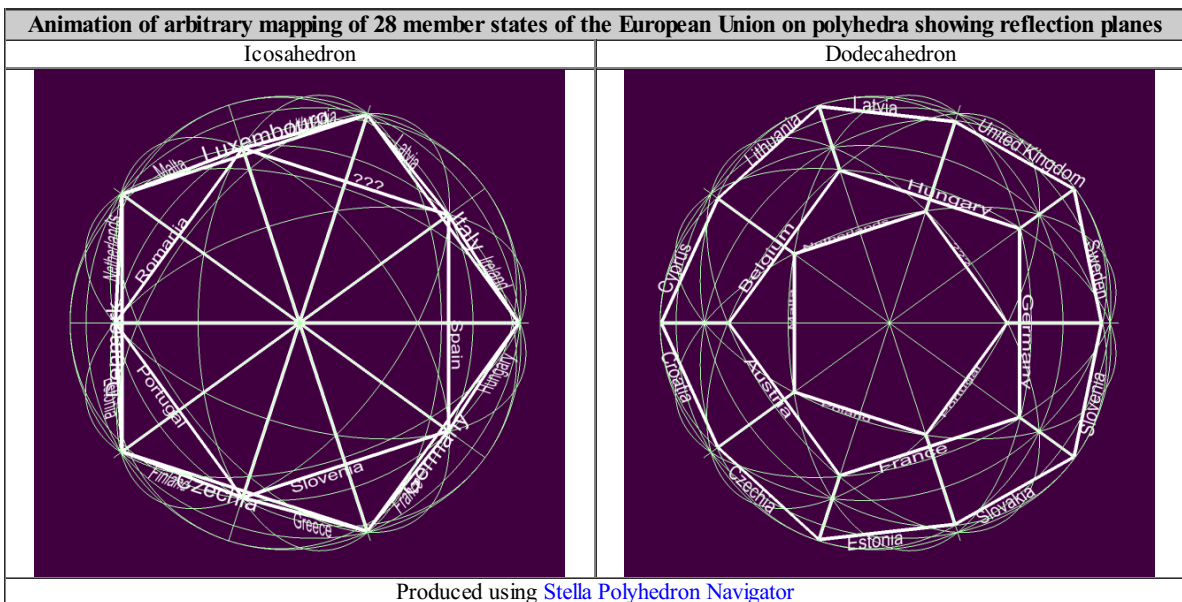
Further indications of symmetry can be added to such depictions, as suggested by the following.

Coherence suggested by animation of polyhedra showing both symmetry axes and reflection planes	
Icosahedron	Dodecahedron



Produced using [Stella Polyhedron Navigator](#)

Text can be readily added to such polyhedral representations, the problem being to avoid cluttering the depictions in this case. Examples are given separately of the use of such an approach with respect to the *European Convention on Human Rights*, *Arab Charter on Human Rights*, and the *Universal Declaration of Human Rights* (*Dynamic Exploration of Value Configurations: polyhedral animation of conventional value frameworks*, 2008).



Produced using [Stella Polyhedron Navigator](#)

Structural questions and commentary

Possible insights relating to N-foldness of conceptual organization **more generally** are discussed separately (*Patterns of N-foldness: comparison of integrated multi-set concept schemes as forms of presentation*, 1980; *Examples of Integrated, Multi-set Concept Schemes*, 1980; *Patterns of Conceptual Integration*, 1984).

Hidden coherence? It is particularly interesting to note how many of the multi-point articulations of the European Union are usefully "captured" in mapping terms by the geometry of either the icosahedron or the complementary dodecahedron -- widely considered as exemplars of symmetry.

Arguably there is a "geometry" to the European Union as a complex of strategic initiatives -- a geometry which has been effectively "hidden" such as to diminish appreciation of its coherence. This is unfortunate in a period of institutional crisis for the European Union with the rapid emergence of euroscepticism. The current approach to the representation of its complexity clearly encourages misrepresentation.

Questions: Basic questions with regard to the European Union include:

- how is the apparent preference for certain patterns of N-foldness to be explained and justified in systemic and other terms (memorability, etc)?
- if the number of elements is assumed to be strictly arbitrary, why are certain patterns not evident or seemingly rare (eg 11-point, 13-point, 17-point)?
- how is the existence of larger sets to be understood, given the probability that as a set they stretch the limits of comprehensibility?

Of potentially greater relevance are the following:

- is there any particular relationship to be understood between strategies, principles and "Action Plans" of a given number?
- why is it so extremely rare to detect any effort to interrelate the strategic points in any articulation in terms of their interference and symbiotic effects, understood in systemic terms (feedback loops, etc)? Are these in any way implied by the geometry, notably the intersection between elements? The question is especially relevant to the extent that a set frames a strategic approach which is called upon to "work", as raised by the proclivity for 20-fold sets (*Requisite 20-fold Articulation of Operative Insights? Checklist of web resources on 20 strategies, rules, methods and insights*, 2018)
- if there are cultural preferences and sensitivities for particular patterns of N-foldness, why make specific use of a pattern which may clash with those preferences, as in the case of:
 - [6 Principles for further developing EU-Turkey Cooperation in tackling the Migration Crisis](#) (2016), given the very notable preference for 8-foldness in China
 - [6 Principles for further developing EU-Turkey Cooperation in tackling the Migration Crisis](#) (2016), given the very notable preference for 5-foldness in Islamic cultures
 - [12-point commitment to respect the landmark 2015 nuclear agreement](#) (2019), given the very notable preference for 5-foldness in Islamic cultures
- given the role of 30-foldness in the polyhedral mappings used, of what relevance is this to the articulated sense of limiting the enlargement process of the European Union, in the light of the countries currently negotiating accession and the possible secession of the UK? Is there some undeclared sense of 30-fold completeness to the coherence of the EU?

Problematic cases? A particular case study is suggested by examples of 17-fold articulation ([17-point plan of action on Western Balkans Migration Route](#), 2015), notably in the light of the commentary by Katarina Kosmina and Lana Radovanovic (*Lessons Not Learned Commentary on the EU's 17-Point Plan and Its Alternative*, European Policy Centre, 3 November 2015). Of related interest is the 17-point set of UN Sustainable Development Goals (2015), notably criticized as being a "mess" (*The 169 Commandments*, *The Economist*, 26 May 2015). This superseded the UN's 8-fold set of Millennium Development Goals (2000). The two sets of goals are the subject of a separate commentary (*Interplay of Sustainable Development Goals through Rubik Cube Variations: engaging otherwise with what people find meaningful*, 2017).

Especially of interest, however, is the seeming "awkwardness" of a 7-point articulation, given that the very structure of the European Union is defined by the [Treaty on European Union](#) (2007) as a 7-fold complex of EU's principal decision-making bodies. This was discussed in the main paper in terms of their mapping onto the highly unusual Szilassi polyhedron -- unusual in that it has 7 faces, each in contact with the others. As shown in the table above, there is a form of "transition" through the cuboctahedron (with 7 face axes) to the Szilassi polyhedron.

Transitional coherence and variable geometry? The possibilities of so-called "variable geometry" are discussed in the main paper, notably in relation to the process of [morphing](#) between structures with properties in common, as illustrated there between the icosahedron and the dodecahedron (as [polyhedral duals](#)).

Of interest are the circumstances under which greater coherence is offered by mapping features onto faces, vertices or edges -- and what morphing to the corresponding perspective then implies. Aspects of this question are discussed with respect to *Engaging with Globality -- through cognitive lines, circlets, crowns or holes* (2009).

More provocative is the sense in which the dual perspective may be a challenge to the mindset associated with its complementary form -- whether the challenge is as an "alternative" framing or as highlighting otherwise neglected patterns of systemic significance. Potentially even more provocative is any sense in which a dual form is the "shadow" of the other (metaphorically understood), with all this may possibly imply in terms of unconscious patterns. It was in this sense that the main paper drew attention to the **dynamics** between representational forms rather than any **static** focus on one or the other. A more general pattern of dynamic transformations between polyhedral forms of potential significance has been presented separately (*Memetic Analogue to the 20 Amino Acids as vital to Psychosocial Life?* 2015).

Of interest is whether the transformations between various patterns through which the European Union can be perceived lend themselves to its representation in terms of an analogue to the [mappings of metabolic pathways](#) in biochemistry.

Especially significant as an intermediary in such variable geometry is the [cuboctahedron](#), as extensively studied by Buckminster Fuller -- and widely presented through the dynamics of the so-called Jitterbug Transformation (*Buckminster Fuller's Jitterbug*, YouTube, 2007; Joe Clinton, *R. Buckminster Fuller's Jitterbug: its fascination and some challenges*, YouTube, 2011). This features the transformation between a set of concentrically arranged polyhedral forms through an unusual twisting-contracting, inside-outing dynamic (H. F. Verheyen, *The complete set of Jitterbug transformers and the analysis of their motion*, *Computers and Mathematics with Applications*, 17, 1989; *Buckminster Fuller Demonstrating the Jitterbug Movement of the Vector Flexor*, 1 September 2014; *Vector Equilibrium and its Transformation Pathways*, 1980).

Complementary perspectives? It is clear that articulated sets may well be very carefully reviewed from a **legal perspective**. Less evident is to what degree they are reviewed in terms of wider comprehensibility and memorability -- a **"public relations" perspective**, especially with what that may imply for decision-makers. More problematic is the question whether they are effectively reviewed in terms of their **systemic implications**, notably how any one element of the articulation may impact another in practice. These requirements clearly call upon different degrees of competence and expertise of which only the first is especially obvious during the process of articulation. The challenge is well-defined by the title of a UNHCR document: *Bringing the New York Declaration to Life: Applying the Comprehensive Refugee Response Framework* (2016). To such complementary perspectives might be added a **symbolic**

perspective, potentially fundamental to the communicability and viability of any strategic framework.

Arguably a well-formed and memorable set of N-fold points is appreciated -- and rendered credible in operational terms -- to the extent that there are more symmetry effects interrelating the elements and effectively reinforcing one another. This effect is evident in a memorable poem or song. The aesthetics of a set are argued separately (*A Singable Earth Charter, EU Constitution or Global Ethic?* 2016). The main paper indicates the role of the **golden ratio** its relation to the **golden rectangles** characteristic of icosahedron and dodecahedron (Gary Meisner, *Golden Ratio in Art Composition and Design, Phi 1.618: the Golden Number*, 4 May 2014; Jordi Solà-Soler, *Phi in Sacred Solids, Sacred Geometry*). Given the well-recognized role of phi in architecture and design in general, it could be asked whether this offers clues to appropriate organization design within an institutional complex like the European Union.



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