

Dialogic Design Science

An Approach for Co-Creating Visionary Anticipations

Maria Kakoulaki^a, Thomas R. Flanagan^a, and Alexander N. Christakis^{a,@}

a: Institute for 21st Century Agoras

@: alexander.n.christakis@gmail.com

Introduction

Dialogic Design Science has been developed as a conceptual discipline comprised essentially of thirteen principal components. In this chapter, these components are organized in accordance with the relationship of “referential transparency”, as prescribed by the Warfield Domain of Science Model (DOSM). The DOSM provides not only useful knowledge for general awareness of the intent of a science, but also ensures a needed discipline for the evolution of a science. Moreover, it can highlight the foundation of a science, namely that domain of the science that can propagate from fundamentals throughout the science to its applications. In this chapter, the linkages among the thirteen components of Dialogic Design Science are transparent, as an aid in identifying points of engagement for members of the community of practitioners of the science as well as the community of stakeholders, who are the ultimate beneficiaries and users of the science. The approach taken in this chapter is generically appropriate for all conceptual sciences, where different actors in the community may have loosely informed understandings of their roles in the evolution and application of the science.

The discovery of the referential transparency among the components, employs the Interpretive Structural Modelling (ISM) method, in order to display graphically the linkages among them. It identifies the seven axioms of the foundation domain of the science as the most highly leveraging components. On the other hand, the most highly leveraged component of science is the co-laboratory of democracy belonging to the applications domain. The DOSM requires, that through the application of a science, a community of practitioners does have the means of challenging and revising its axiomatic foundation.

Such a revision of the axiomatic foundation of the science is relevant at this juncture of its evolution, as it is in the process of transitioning from a face-to-face co-laboratory and small-scale-applications-focus, to a large-scale-engagement of virtual communities of stakeholders, assembled through appropriately designed Internet platform in coordination with a dedicated facility for public deliberation called Demoscopio. The prospective research for the evolution of the science is focusing on the development of the “iDemocreate Platform”, in conjunction with the Demoscopio capability; which is the place, the space, and the methodological mix for engaging communities of stakeholders in coherent design dialogue. The purpose is for them to become co-owners of their own complex situations and co-creators of their own resolutions. Finally, this chapter includes a case-study of the Futures-Creative Archetype, of the co-laboratory methodology, for the co-creation of sustainable futures for fifteen wine villages from the region of Troodos mountain of Limassol, in Cyprus.

The Domain Of Science Model (DOSM)

The Domain of Science Model (DOSM) presented by John N. Warfield in 1986 espouses the wisdom of drawing distinctions among the four domains of any science, as well as the distinction between the corpus and the arena of a science (See Figure 1). Warfield characterizes “steering functions” which link foundation, theory, methodology and applications in a virtuous cycle which advances the quality of the science. This model calls attention to the flow of experience from applications of the science in the arena upon the foundation of the science; which is to say upon the axiomatic base of the theories supported by the science. It is important that any science explicitly recognizes the axioms upon which it is founded, because disparities discovered in application of the science must be understood first as a manifestation of an axiomatic understanding or a manifestation of something which has not been considered in prior theories. In this chapter we focus on the theory and applications domain.

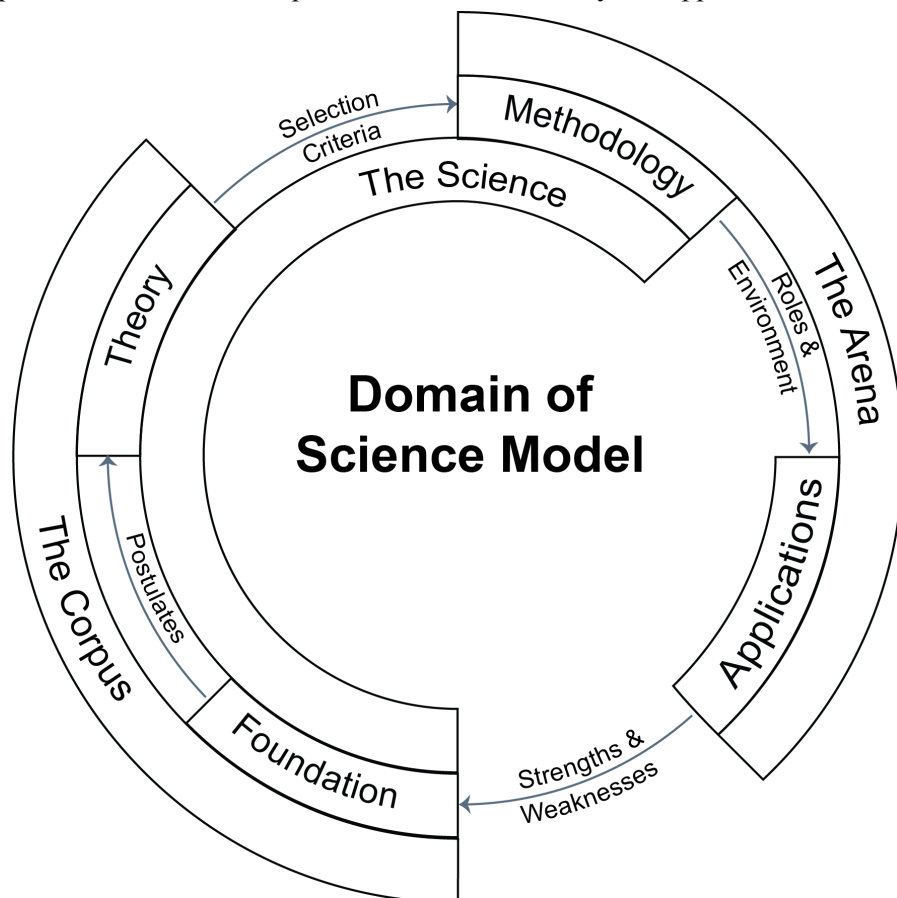


Figure 1. Domain of Science Model (DOSM) modified after John N. Warfield. Efforts to work with groups reflect applications used in the “arena.” Successes and Failures in the arena contribute to design principles, which in combination with dialogue, systems, and design theories constitutes the “corpus” of the science. Through selection criteria, practitioners devise methods for specific use in the “arena,” and test the new methods through their impact. An expanding number of practitioners constitute the “community of practice,” which completes the DOSM cycle to build further on the “corpus” of the science.

In this chapter we briefly discuss the seven laws included in the theory domain of the science and focus on an application case and the methodology we used for that case.

Referential Transparency

While the Warfield DOS Model is elegant in its generic simplicity, it doesn't capture significant components of the interplay of basic and applied science in a system view. This is to say that the model has heuristic value in understanding the science, but lacks power for guiding the evolution of the science. Where, for example, might limited resources be invested to maximize the advance of science? To approach this question, Interpretive Structural Modelling was employed to map supportive inferences among thirteen principal components of dialogic design science. The selected components were chosen by the authors of this paper and corroborated through extended online discussions by a community of theoreticians and practitioners of the DDS based in North America, Mexico, Europe, Africa and Australia in 2007. The thirteen components were structured using the generic question: “*Will consideration of component X, significantly support the inference of component Y, in the context of the DOSM typology?*”

Figure 2: Influence Pattern of Components

Triggering Question:

“What are the principal ‘Component concepts’ of Dialogic Design Science?”

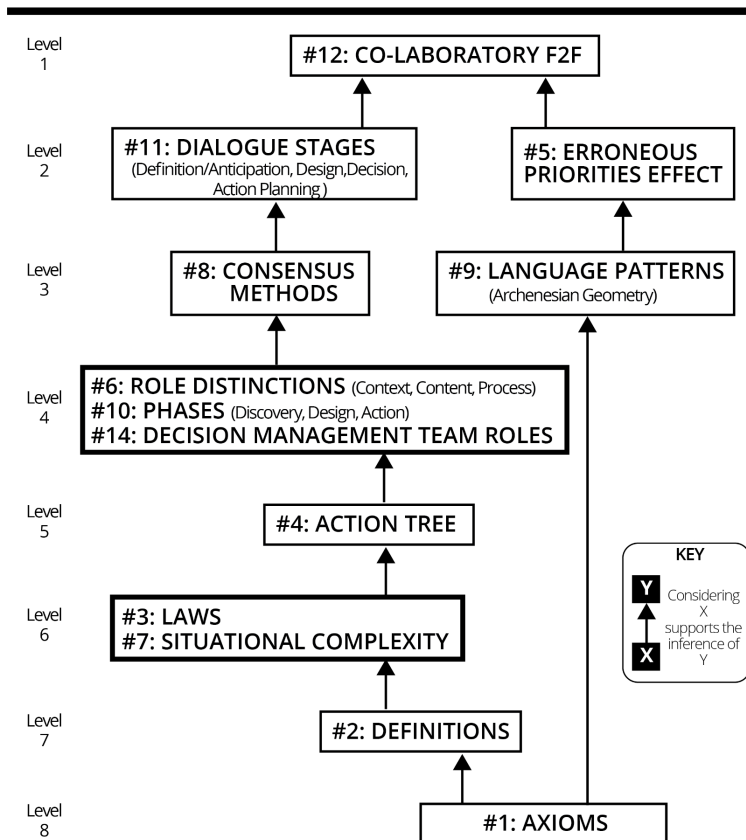


Figure 2. It shows the referential transparency among the thirteen components of the science.

Theory

A central tenet of the theory is that dialogue managers (also known as design managers or as process facilitators), do not inject their own views into the content of the community design as it is produced by

the Dialogic Design Science in the arena of practice. Dialogic design science applies the laws of the science in a methodology that guides such activities as stakeholder selection, framing of triggering questions, performance of the design management team roles, and even into publication or performance of understandings and narratives assembled by the community of stakeholders.

The 7 Laws Of DDS

Dialogic Design Science is constructed upon a set of seven laws which specify requirements for:

1. Variety. The Law of Requisite Variety demands that an appreciation of the diversity of perspectives and stakeholders is essential in managing complex situations. The Law of Requisite Variety is attributed to William Ross Ashby.
2. Parsimony. The Law of Requisite Parsimony states that structured dialogue is needed to avoid the cognitive overload of stakeholder/designers (George Miller).
3. Saliency. The Law of Requisite Saliency states that the relative saliency of observations can only be understood through comparisons within an organized set of observations (Kenneth Boulding).
4. Meaning. The Law of Requisite Meaning states that meaning and wisdom are produced in a dialogue only when observers search for relationships of similarity, priority, influence, etc., within a set of observations (Charles Sanders Peirce).
5. Autonomy and Authenticity. The Law of Requisite Autonomy and Authenticity in distinction-making demands that during the dialogue it is necessary to protect the autonomy and authenticity of each observer in drawing distinctions (Ioanna Tsivacou).
6. Evolution of Observations. The Law of Requisite Evolution of Observations states that learning occurs in a dialogue as the observers search for influence relationships among members of a set of observations (Kevin Dye).
7. Action. The Law Requisite Action predicts that any action plan to reform complex social systems designed without the authentic and true engagement of those whose futures will be influenced by the change are bound to fail (Hassan Ozbekhan)

Case Study: The Limassol Wine Villages Local Development Project

The application of SDD is illustrated through reference to a case-study of the Futures-Creative Archetype consisting of fifteen wine villages of the Limassol region in Cyprus [1]. The story behind this project is the result of a collaboration with the **Cyprus Academy of Public Administration in 2018**. The fate and future of the regional wine industry was uncertain due to the urbanization of the region and the abandonment of the land by its owners as well as the European Union policies. When the European Union increased its focus on more integrated development based on public participation through a more Cohesion Policy, local leaders in Limassol sought to involve citizens in spatial planning activities using a “territorial- cohesion, place-based and community-led” approach.

Firstly, territorial cohesion, added to the twin goals of economic and social cohesion without a straightforward definition, calls for balanced and harmonious territorial development and the equal treatment of regions, based on their diversity and vastly different characteristics (territorially sensitive approach). Secondly, a place-based approach aimed to unleash territorial potential through development strategies based on local and regional knowledge of needs. And finally, community-led local development

is a methodology, a step-by-step process that helps the territorializing of priorities, enabling every citizen to participate in, and contribute to, improving the economic, environmental and cultural well-being of their local area.

The Limassol vineyard region covers about 200 square miles and sits on the foothills of the largest mountain range of Cyprus. The region is home to some 3,400 people who live within 15 traditional villages that mostly date back to the Byzantine period. The villages are densely built on the slopes of hills about 1400 to 2700 Feet above sea level and have narrow stone-paved streets. Their churches, chapels and monasteries date from the medieval era. The villages are scattered in the landscape, connected by cultivated or abandoned land, vineyards and dry-laid stone terraces. These terraces were constructed to allow the cultivation of medium gradient slopes with vineyards and, to a lesser extent, deciduous orchards such as almond trees. Agricultural land is deteriorating with abandoned vineyards.

The region's economic features (isolation, inaccessibility, economic and population decline) suggested a need for a 'bottom-up,' place-based, participatory process to unleash territorial potential. The same time, however, a decentralization and restructuring of local authorities in Cyprus strongly hampered progress through traditional practices of local democracy. Public participation, when sought, was hampered by limited capacity to discuss strategies which might place public interest above personal interests. Local authorities, also, lacked capacities for managing a major development program.

Leaders from the Department of Town Planning and Housing (a unit of the Ministry of Interior of the Republic of Cyprus) along with representatives from the Council of Europe, agreed to try and launch the Limassol Wine Villages Local Development Pilot Project. The pilot mission was to determine the contribution of "heritage" to local and regional development. Through a series of thirteen working meetings (i.e., Collaboratories), no fewer than one hundred forty citizens would contribute from their wisdom and their aspirations. This representation would lead to drafting a shared vision for the territory, and that vision would be used as a roadmap to establish the Collaborative Action Agenda.

The regional issues that were of greatest administrative concern included: dereliction, abandonment and depopulation of villages (particularly remote and mountainous settlements); deterioration of "dry-laid" stone terraces supporting the vineyards whose uses have changed with mechanization; and a loss of an authentic cultural landscape accelerated by a gradual return of natural vegetation, frequent summer fires, and erosion caused by winter rains. To address this messy, wickedly complex situation Structured Dialogic Design (SDD) was chosen at the process to manage the task of organizing and facilitating public participation and consultation with all the actors, including local inhabitants and key partners from outside the area.

The SDD approach was discussed by leaders, who came to believe such a methodology could allow citizens to express their knowledge and preferences in a way that would reveal steps for achieving them.

SDD managed both dialogue and also to inform participants to construct a model of their own understanding of the complex situation, their options for responding to the situation, and their preferred path of action. The information management task was supported with computer software that collected and tracked the group's ideas, and monitored ideas which were incorporated into the group's influence trees. The reported results of the group's decisions were represented by the threads showing the reasoned connections that the group determined to link all of the ideas into a coherent system view of their situation. The roots of the tree projected strong influences that resulted in the upper branches of the tree. The tree then served as a critical means to discuss the group's shared understanding. The combined use of

computer-assisted information modelling, while a group was engaged in design dialogue, was first introduced as “Interactive Management” [2,3] and has been enhanced with improved desk-top computers and screen display technologies. The first generation of enhanced is reported in the literature as the CogniSystem® [4,5], and the latest version is the Logosofia® [6]. The combined use of dialogue and information management with the Structured Dialogic Design paradigm has been validated through 40 years of application in large groups from many cultures and many dimensions of the public sphere. SDD is currently practiced by a community of theoreticians and practitioners based in North America, Mexico, Europe, Africa and Australia. The workshop practices are called co-laboratories (i.e., “co-laboratories of Democracy;” [4,5])

Case Study Methodology

The Dialogic Design Science ‘s various stages and phases of the process can be summarized as follows:

a. Preparatory Phase:

1. Setting up the Knowledge Management Team’ (KMT): The team consists of the representatives of those experiencing the complex problem, in this case the Local Authorities and selected public or other organizations and by the specialized Facilitators. In this case, the KMT consists of the President of the Local Authorities of the area, the directors of the two Development Companies, active in the area, representatives of the Department of Town Planning and Housing and other selected governmental departments as well as from the Cyprus Tourism Organization. The specialized facilitators provide the methodological support. The KMT plays a crucial role in coordinating the process, as described below.
2. Identification of relevant stakeholders: This process is initiated some time ahead of the DDS Colaboratory. It is of paramount importance to invite relevant and appropriate stakeholders. Stakeholders that accurately represent elements of the subject, cover all of its facets and are willing to positively contribute to the process are key to ensuring that the outputs of the DDS will be of value (local stakeholders and relevant public and semi-public organizations, NGOs etc.)
3. Framing the triggering question (TQ): The KMT is responsible for the engagement and consultation with the relevant stakeholders in order to frame the triggering question (TQ). Due to the importance of the TQ in the whole process, it is imperative that it has been reasoned and reflects the input of the project team as well as the external participants.
4. Writing the White Paper: Following definition of the TQ, it is important to provide the participants with the information required to fully engage in the face-to-face element of the process. This includes provision of any background reading materials, any required resources, the TQ itself, and any information supporting how the TQ is defined.
5. Invitation: The selected participants that represent the various stakeholders are invited. The KMT ensures that all the stakeholders will be represented and sends additional invitations, if necessary. The invitation is accompanied by the above-mentioned Report.

b. DDS Colaboratory

1. The participants are invited to answer the TQ at a round-table session, through a single and concrete sentence-proposal. All answers are recorded on the CogniScope/Logosofia software, printed and hung on the wall.
2. The authors of the proposals clarify and describe their ideas. The other participants can ask for additional explanations but discussion and criticism are not permitted.
3. The participants cluster all the answers into groups according to their contents, resemblances and common characteristics. This gives a further opportunity to understand all the various dimensions and perspectives of the different answers and reach a broader consensus.
4. The participants are invited to vote for the five more significant ideas. Only the ideas that received votes will participate in the next phase.
5. The participants are asked to explore the links between the selected ideas in order to investigate how an idea could influence significantly another one. If the answer is 'yes' (with an increased majority) then this is recorded using the relevant software, which uses mathematical algorithms to minimize the number of queries necessary for exploring relationships between ideas. The method allows the differentiation between the notion of the 'importance' and 'fundamentality' of an idea when compared and evaluated in relation to another idea. The final result depicts the interrelation between the different characteristics. These relations are recorded in order for the software to produce an 'influence tree'.
6. The 'influence tree' is produced and presented to the participants, subject to discussion.

c. Dissemination Phase:

1. The KMT produces the Report of the DDA Workshop that includes the description of the process, the participant list, the answers to the TQ, the elaborated groups, the voting status and the 'influence tree'. This is further analyzed: the ideas on the base of the 'tree' can be considered as the most fundamental, whereas the ideas at the top can be considered as consequences.
2. The report is disseminated to all stakeholders and other relevant Bodies and Organizations.
3. The KMT suggests the planning of further steps.

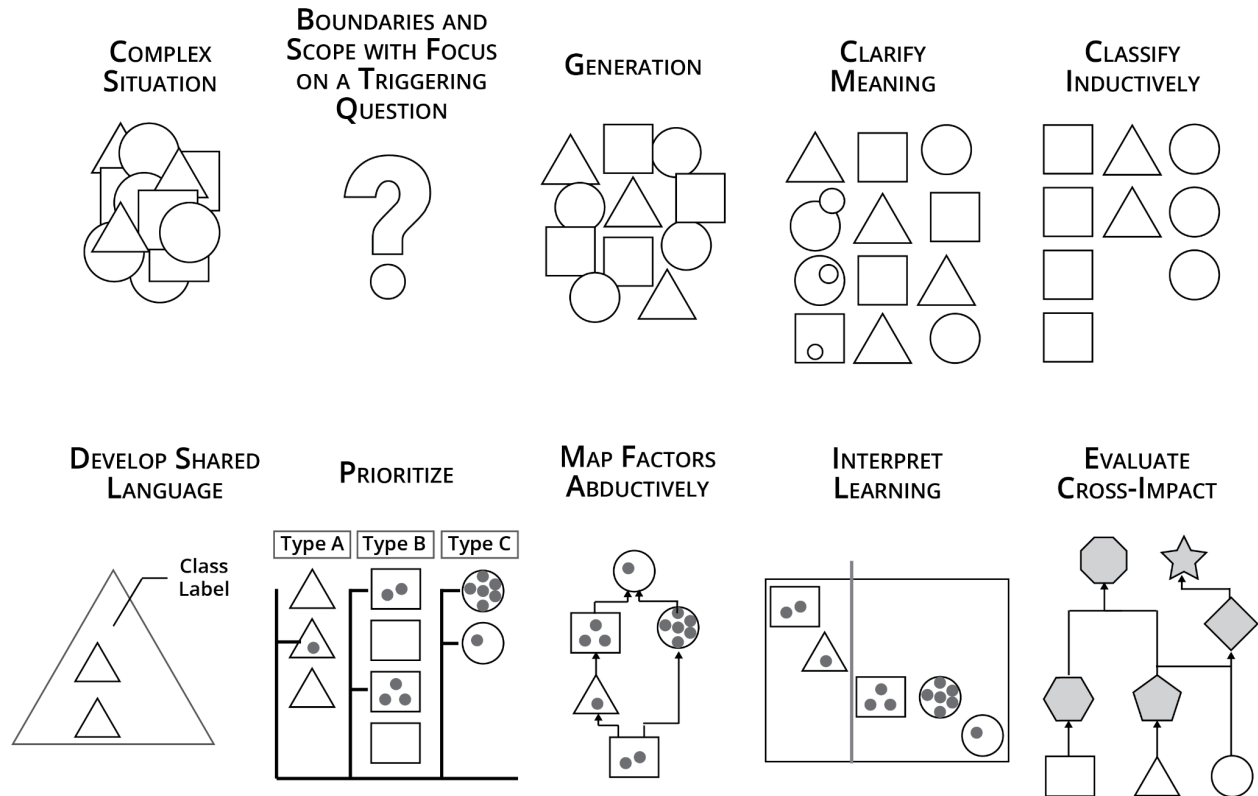


Figure 3. Successive steps of the Collaboratory Methodology.

Finally, the study methodology employed the Retroductive Design and Development Frame (see Figure 6). This frame enables communities of stakeholders to construct successive and flexible approximations of visionary anticipations. The diagram displays graphically the important distinctions between the “ought to be,” the “can be,” and the “will be.” Ozbekhan wrote in a paper titled *The Triumph of Technology: “Can implies Ought”* [7]. The principal idea in his paper was that “feasibility” dictates “desirability.” We do what “we can do,” instead of doing what “we ought to do.” In the diagram the feasibility of the “can be” is shown by a “wall of barriers or constraints,” preventing the stakeholders from attaining their idealization. Just like the ideal future is constructed with public input, the wall of barriers is also constructed by a DDS Collaboratory engaging the stakeholders in a dialogue that focuses on the identification of barriers and their linkages. The third Collaboratory is focusing on the “will be done,” enabling stakeholders to construct the transition scenario on how to change the current situation and approximate the ideal future.

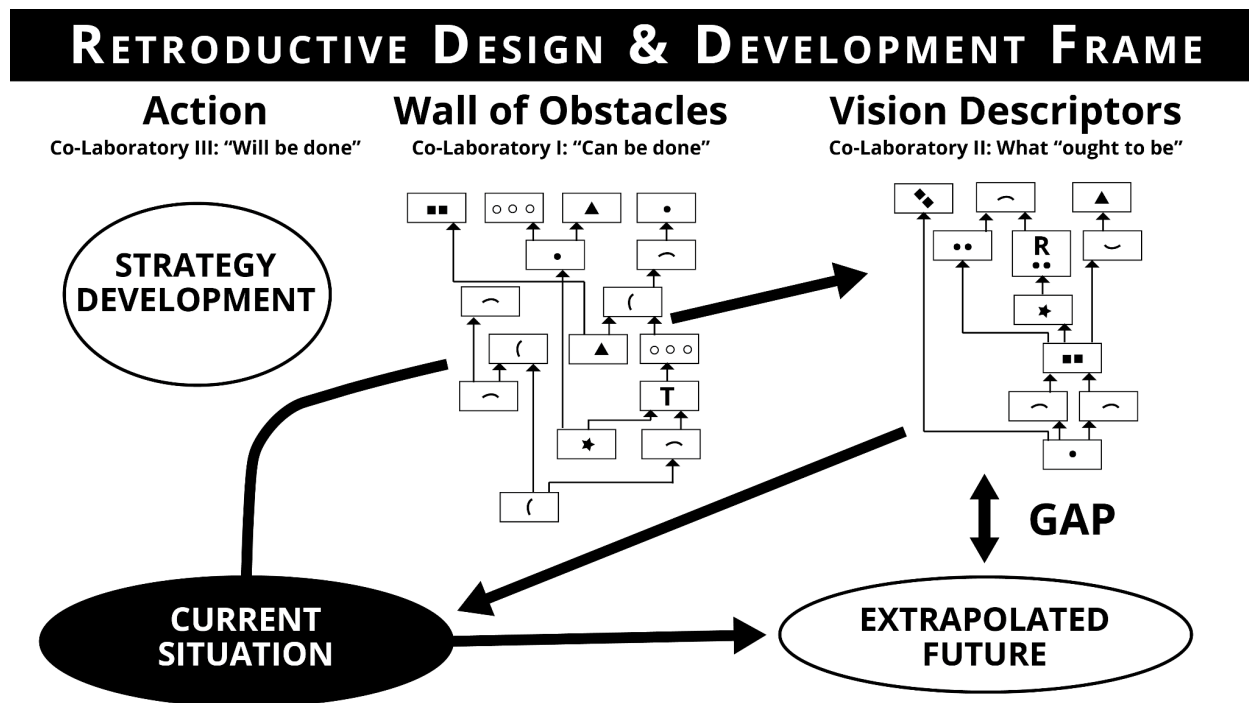


Figure 4: Retroductive Design and Development Frame Diagram.

New Frontiers: *iDemocreate*

Our vision for the prospective research requires the development of a new platform, which we have defined as “iDemocreate” and will be based on the current state of Dialogic Design Science, such as described in the Foundation, Theory, Methodology, and Application in accordance with DDS. Currently, dialogues conforming to DDS guidelines take place in a physical, face-to-face Co-laboratory, that creates the conditions and the atmosphere for the promotion and cultivation of empathy among people, as the necessary component for productive deliberations. Dialogues are facilitated by trained process experts, and the discussions are supported by specially designed software, (CogniScope, Logosofia). However, under the current practices of DDS, certain limitations are imposed, related to the initiation, dissemination and scalability of the dialogues: (a) scalability with respect to the opportunities that people have to be engaged, initiate, or participate in face-to-face dialogues, (b) prerequisites (physical, material, expertise, knowledge, etc.), required for the dialogues to take place, (c) dissemination of the consensual findings and recommendations produced in the Co-Laboratory dialogue. The capabilities offered today by ICT technologies, as well as their use by people, are thus very relevant to the features, processes and intentions of DDS dialogues.

iDemocreate is a vision for the future based on the Dialogic Design Science and is meant to combine ICT technologies, web and mobile interfaces, as well as the power of online social networks, to produce the first -open to everyone- virtual space and ICT platform capable of fully encompassing the enhancement of systemic dialogue and collaborative awareness as an interdisciplinary model. The platform will act as the foundation for the co-creation of alternative face-to-face social networks for optimizing citizens' empathy, accountability, responsibility, and innovative spirit so that it would facilitate

the emergence of a new paradigm of democratic collective awareness and collaboration for civil societies. iDemocreate as an innovation action and interdisciplinary platform, will harness collective wisdom and empower social networks for systemic design and sustainability.

iDemocreate platform aims at expanding, enhancing and achieving the most effective and efficient implementation and dissemination of the current DDS practices, via the employment and utilization of modern ICT technologies. The end goal is to achieve collaborative awareness and consensus building, via cooperation, transparency, co-creation and innovation among the citizens of Europe, solving complex societal problems. Moreover, in order to better fit the iDemocreate platform to the needs of the users and to customized environments and conditions, its design and implementation will be driven by the feedback and the experience gained through the project.

In light of the above, the iDemocreate platform objectives are: a) To create and organize new social capital among citizens, municipalities, institutions, the academic community and the external business entities. b) To serve as a design-hub and innovative, democratic Co-laboratory for interdisciplinary research and dialogue, through transparent outcomes and displays. c) To contribute by means of a virtual space, along with the tremendous power of online social networks and easy-to-use technologies and interfaces, in enhancing the applicability of the DDS in Europe. d) To incorporate software tools (with web-platforms and mobile applications) for the dissemination of the knowledge created in the Co-laboratory face-to-face dialogue. e) To raise the collective awareness of the citizens, in collaboration with all partners, by the application of the iDemocreate platform for the definition and resolution of societal complexity as a bottom-up process, by using local knowledge and global data, to produce “glocal” [re]solutions for social issues.

Conclusions

The Limassol Wine Villages case-study has proved to be a unique opportunity to experience a place-based approach together with its complementary method of community-led local development. The study area presents a cultural and environmental endowment, and the numerous stakeholders were carefully selected and were really enthusiastic and actively involved. The preliminary outcome of the whole process was more than satisfactory since it is the product of a common effort that is consolidated and non-contradicted. The DDS is undoubtedly an effective instrument of community-led local development. It is a qualitative, creative and comprehensive method of achieving results, designed in such a way as to encounter complex issues and to harness the collective wisdom of all participants, regardless of their educational and cultural background. Thus, the priority now is to customize this method in spatial planning as a possible substitute of Joint Boards, aiming to improve planning procedures and participatory practices. The experience of the Limassol Wine Villages case-study seems to be a useful teaching tool and perhaps a revelation, a new aspiration into what models of development we should seek after in the future, especially during this period of economic crisis and pandemics. The involvement of the locals in the place-based approach, in the way which has been experienced, encourages a certain type of life: a clearer understanding of the place, a recall to quality values, a return to what heritage is all about.

References

1. Kakoulaki M. The wine villages of cyprus: from the visionary anticipation to the sustainable development. Cyprus Academy of Public Administration & Nicosia Town Planning Department. 2012.
2. Warfield J. A Science of Generic Design. The Iowa State University Press.; 1994.
3. Christakis AN, Bausch KC. CoLaboratories of Democracy: How People Harness Their Collective Wisdom to Create the Future. IAP; 2006. Available: https://play.google.com/store/books/details?id=g_onDwAAQBAJ
4. Christakis AN. A people science: The CogniScope system approach. Systems: Journal of Transdisciplinary Systems Sciences. 1996;1: 16–19.
5. Christakis AN, Bausch KC. How people harness their collective wisdom and power to construct the future in co-laboratories of democracy. IAP; 2006.
6. Christakis A. Logosofia Software. Michigan Department of Education; 2016.
7. Ozbekhan H, Jantsch E, Christakis AN. The predicament of mankind: A quest for structured responses to growing world-wide complexities and uncertainties. Proposal to the Club of Rome. 1970.
8. Bausch K, Christakis A. Technology to liberate rather than imprison consciousness. The Great Adventure: Toward a Fully Human Theory of Evolution. 2003; 181. Available: https://books.google.com/books?hl=en&lr=&id=mi1KWApYkh4C&oi=fnd&pg=PA181&dq=Technology+to+Liberate+Rather+Than+Imprison+Consciousness&ots=7f9nhPho-o&sig=B14L-7jb7_HOY Yj89iaq5CCcVJs
9. Bausch KC, Christakis AN. With reason and vision, structured dialogic design. Ongoing Emergence Press, Cincinnati, Ohio; 2015.
10. Boulding KE. The Impact of the Social Sciences. Rutgers University Press; 1966. Available: <https://play.google.com/store/books/details?id=6b8kAAAAMAAJ>
11. Christakis AN. An Epic Learning Journey: From the Club of Rome to Dialogic Design Science and DEMOSOPHIA. In: Metcalf GS, editor. Social Systems and Design. Tokyo: Springer Japan; 2014. pp. 37–69. doi:10.1007/978-4-431-54478-4_2
12. Christakis AN. A new policy science paradigm. Futures. 1973;5: 543–558. doi:10.1016/0016-3287(73)90019-0
13. Christakis AN. High technology participative design: The space-based laser. Gen Syst. 1987;30: 69–75.
14. Christakis AN, Warfield JN, Keever D. Systems design: generic design theory and methodology. Systems Governance, Publisher Ant N Sakkoylas, Athens-Komotini, Greece. 1988; 143–210.
15. Christakis AN. The club of Rome revisited. Gen Syst. 1988;31: 35–38.
16. Christakis AN. The inevitability of demosophia. A challenge for systems thinking: The Aegean

seminar. University of the Aegean Press, Athens, Greece; 1993. pp. 187–197.

17. Christakis AA, Warfield J. Proposal for the Establishment of Interactive Management of Crete, submitted to the Ministry of Coordination, Government of Greece. 1983.
18. Christakis A, Dye K. Collaboration through communicative action: resolving the systems dilemma through the CogniScope™, Systems. *J Transdiscipl Syst Sci.* 1999;4: 9–32.
19. Christakis AN, Brahms S. Boundary-spanning dialogue for the 21st-century agoras. *Systems Research and Behavioral Science: The Official Journal of the International Federation for Systems Research.* 2003;20: 371–382. Available: https://onlinelibrary.wiley.com/doi/abs/10.1002/sres.508?casa_token=aAnAam-8yk4AAAAA:VC3QOSGTirVWedHoiJZiCRFzltieYTLodggqHxlgEEoh-xhV-WkXtuFUILX6V4iX9A7PXrGY1KGtrw
20. Christakis AN, Dye K. The Cogniscope™ Lessons Learned in the Arena. *Dialogue as a Collective Means of Design Conversation.* 2008. pp. 187–203. doi:10.1007/978-0-387-75843-5_13
21. Christakis AN, Harris L. Designing a transnational indigenous leaders interaction in the context of globalization: a Wisdom of the People Forum. *Syst Res Behav Sci.* 2004;21: 251–259. doi:10.1002/sres.619
22. Flanagan TR, Christakis AN. *The Talking Point: Creating an Environment for Exploring Complex Meaning.* IAP; 2010. Available: https://play.google.com/store/books/details?id=p_0nDwAAQBAJ
23. Kakoulaki M, Christakis AN. Demoscopio: The Demosensual [R]evolutionary Eutopia. *Balancing Individualism and Collectivism.* 2017. pp. 429–460. doi:10.1007/978-3-319-58014-2_21
24. Schreibman V, Christakis AN. New agora: new geometry of languaging and new technology of democracy: the structured design dialogue process. *Int J Appl Syst Stud.* 2007;1: 15–31. doi:10.1504/IJASS.2007.013814
25. Flanagan TR, Bausch KC. *A Democratic Approach to Sustainable Futures: a workbook for addressing the global problematique.* Ongoing Emergence Press; 2010.
26. Flanagan T. *Blueprint for a digital observatorium.* Worlds Futures Forum, Montreal, Canada. 2013.
27. Kakoulaki M. *Dialogue beyond borders* documentary based on interviews Israel, Palestine, Cyprus. 2015.
28. Kakoulaki M. *Futu[R]evolution.* 2011-2016.
29. Miller GA. The magical number seven plus or minus two: some limits on our capacity for processing information. *Psychol Rev.* 1956;63: 81–97. Available: <https://www.ncbi.nlm.nih.gov/pubmed/13310704>
30. Lasswell HD. *Strategies of inquiry: the rational use of observation. The human meaning of the social sciences.* 1963; 89.
31. Lasswell HD. *Technique of Decision Seminars.* *Midwest Journal of Political Science.* 1960;4: 213–236. doi:10.2307/2108975
32. Ozbekhan H. Pertinent excerpts on “Futures Creation.” In: Ozbekhan H, editor. *Toward A General Theory of Planning.* 1977.

33. Peirce CS, Others. What is a sign. The essential Peirce: Selected philosophical writings. 1894;2.
34. Sennett R. The spaces of democracy. University of Michigan, College of Architecture+ Urban Planning; 1999. Available: <https://my.vanderbilt.edu/greencities/files/2014/08/Sennett.pdf>
35. Turkle S. Reclaiming Conversation: The Power of Talk in a Digital Age. Penguin; 2005. Available: <https://play.google.com/store/books/details?id=POpJBgAAQBAJ>
36. Tsivacou I. The rationality of distinctions and the emergence of power: A critical systems perspective of power in organizations. Syst Res Behav Sci. 1997;14: 21–34.
doi:10.1002/(sici)1099-1743(199701/02)14:1<21::aid-sres117>3.0.co;2-u
37. Warfield NJ. Societal Systems. Planning, Policy and Complexity. 1976.
38. Warfield JN, Corderas AR, Cardenas AR. A Handbook of Interactive Management. 2nd ed. Ames, IA: Iowa State University Press; 1994. Available: http://futureworlds.eu/w/1/5/57/Handbook_of_Interactive_Management.pdf