AURAVANA PROJECT

PROJECT FOR A COMMUNITY-TYPE SOCIETY

The Decision System

SSS-DS-003 | May 2024

SOCIETAL SPECIFICATION STANDARD

aurayana.org

THE AURAVANA PROJECT

SOCIETAL SPECIFICATION STANDARD

THE DECISION SYSTEM

Document Reference Identifier: SSS-DS-003

Date of Document Distribution: May 2024

auravana.org

To cite this publication:

- *The Decision System.* (2024). Auravana Project, Societal Specification Standard, SSS-DS-003. [auravana.org]

To cite an article in this publication *(authors and article title will change)*:

- Grant, T.A. (2024). *The Decision System Overview*. The Decision System. Auravana Project, Societal Specification Standard, SSS-DS-003. [auravana.org]

ISBN:

auravana.org

GREETINGS

In an effort to provide the greatest possible clarity and value the Auravana Project has formatted the system for the proposed society (of the type, 'community') **into a series of standard publications. Each standard is both a component of the total, unified system, as well as intended to be a basis for deep reflective consideration of one's own community, or lack thereof. These formal standards are "living" in that they are continually edited and updated as new information becomes available; the society is not ever established, its design and situational operation exists in an emergent state, for it evolves, as we evolve, necessarily for our survival and flourishing.**

Together, the standards represent a replicable, scalable, and comprehensively "useful" model for the design of a society where all individual human requirements are mutually and optimally fulfilled.

The information contained within these standards represent a potential solution to the issues universally plaguing humankind, and could possibly bring about one of the greatest revolutions in living and learning in our modern time. Change on the scale that is needed can only be realized when people see and experience a better way. The purpose of the Auravana Project is to design, to create, and to sustain a more fulfilling life experience for everyone, by facilitating the realization of a better way of living.

Cooperation and learning are an integral part of what it means to be a conscious individual human. A community-type societal environment has been designed to nurture and support the understanding and experience of this valuable orientation.

The design for a community-type society provides an entirely different way of looking at the nature of life, learning, work, and human interaction. These societal standards seek to maintain an essential alignment with humankind's evolving understandings of itself, combining the world of which humans are a regenerative part, with, the optimal that can be realized for all of humanity, given what is known.

The general vision for this form of society is an urgent one considering the myriad of perceptible global societal crises. Together, we can create the next generation of regenerative and fulfilling living environments. Together, we can create a global societal-level community.

THE UNIFIED SOCIETAL SYSTEM: DECISION SPECIFICATION STANDARD

This publication is one of six representing the proposed standard operation of a type of society given the category name, 'community' (a community-type society). This document is a specification standard for a decision system.

Every society is composed of a set of core systems. Different types of societies have different internal compositions of these systems. The composition of these systems determines the type of society. The type of society described by the Auravana Project societal standard is a, community-type society. The standard is a composition of sub-system standards. The Auravana societal standard may be used to construct and duplicate community at the global level.

For any given society, there are four primary societal sub-systems. Each of these sub-systems can be specified and standardized (described and explained); each sub-system is a standard within a whole societal specification standard. The first four primary standards of the six total standards are: a Social System; a Decision System; a Material System; and a Lifestyle System. Each standard is given the name of its information system. The fifth publication is a Project Plan, and the sixth is an Overview of the whole societal system. Together, these standards are used to classify information about society, identify current and potential configurations, and operate an actual configuration. Because of the size of some of these standards, they may be split into two or more publications.

Essential figures and tables related to this standard exist beyond what is shown in this document.

Figures and tables on the website are named according to their placement in the standard.

- Those figures that could not be accommodated here are readily accessible in their full size, and if applicable, in color, on the Auravana Project's website [auravana.org/standards/figures].
- Those tables that are too large to include in this document are referenced with each standard on the Auravana Project's website [auravana.org/standards].

Articles

The Decision Service System Overview 1
Decisioning in a Community-Type Society 41
Global Parallel Decision Resolution Inquiry 149
Solution Inquiry Accounting 195
Need and Preference Inquiry Accounting 231
Access Inquiry Accounting 241
Technology Inquiry Accounting 259
Resource Inquiry Accounting 279
Economic Calculation Inquiry Accounting 307
Environmental Inquiry Accounting 407

Article Section Headings

The Decision Service System Overview 1

1 A decision 2
2 Decision modeling 20
3 An economic decision system 25
4 The macro-economic structure of community 36

Decisioning in a Community-Type Society 41

1 The classification of the decision [support] service system 42
2 A systems-based economic [decisioning] model 45
3 An access-based economic [decisioning] model 64
4 A resource-based economic [decisioning] model 95
5 A participatory-based economic [decisioning] model 111
6 A market-State ownership and trade economic [decisioning]model (in contrast to community) 114

Global Parallel Decision Resolution Inquiry 149

1 Decision accounting and inquiry 150
2 Inquiry: Issue articulation 175
3 Inquiry: Issue recognition 177
4 Inquiry: Risks and concerns 183
5 Inquiry: Contribution 187
6 Inquiry: Feedback 187

Solution Inquiry Accounting 195

1 Solution accounting and inquiry 196
2 A solution [production] cycle 204
3 A real-world design-solution 206
4 A documented solution 213
5 A system's life-cycle 223
6 Design and production [control] method 226

Need and Preference Inquiry Accounting 231

1 Need and preference accounting and inquiry 232
2 The need inquiry 234
3 The preference inquiry 235

Access Inquiry Accounting 241

1 Access accounting and inquiry 242
2 Access profile 244
3 Product awareness 245
4 Access behavior 246
5 Access designations 248
6 Socio-technical [life] phasing-in access to specific service-objects 254
7 Localization of access 255
8 Access prioritization 256

Technology Inquiry Accounting 259
1 Technology accounting and inquiry 260
2 The technology development matrix (TDM) 266
3 Technical unit(s) accounting 268
4 Technical unit automation sub-inquiry 271
Resource Inquiry Accounting 279
1 Resource accounting and inquiry 280
2 Resource availability 293
3 Unified habitat heritage network planning of resources 298
4 Resource accounting for societal re-configuration 302
5 Acquisition of resources 304
Economic Calculation Inquiry Accounting 307
1 Calculation accounting and inquiry 308
2 Product coding (assembly identification) 332
3 Optimal resource allocation calculation planning and analysis 334
4 Optimal production design planning and analysis 361
5 Assembly complexity index and analysis 370
Environmental Inquiry Accounting 407
1 Environmental accounting and inquiry 408
2 Environmental impact assessment deliverable 409

Contents

List of figures ... xv
List of tables ... xviii
Document Revision History ... xxii
The Decision Service System Overview ... 1
1 A decision ... 2
1.1 Contextualizing a decision via an overview of possible decision scenarios ... 4
1.2 A decision support system ... 10
1.3 A decision space ... 11
1.3.1 Decision space elements ... 13
1.3.2 Decision optimization ... 15
1.4 Change acceptance ... 16
1.5 Decisioning and voting ... 16
1.6 Decisioning in society ... 18
2 Decision modeling ... 20
2.1 Visualization ... 20
2.2 Rational decision modeling ... 21
2.3 Societal decision information modeling ... 22
2.4 Decision tables ... 22
2.5 Decisioning perspectives ... 23
2.6 Decisioning and societal stability ... 23
2.7 Who makes decisions in a community-type society? ... 24
2.8 How money influences decisioning ... 24
3 An economic decision system ... 25
3.1 What is an economy? ... 26
3.1.1 "Linear" and "circular" economies ... 30
3.1.2 Planning and economies ... 30
3.2 A socio-economic system ... 31
3.2.1 A socio-economic network ... 32
3.2.2 Socio-economic system planning ... 32
3.2.3 Basic economic accounting ... 34
4 The macro-economic structure of community ... 36
4.1 The global production and distribution service architecture ... 38
4.1.1 Community access elements ... 39
Decisioning in a Community-Type Society ... 41
1 The classification of the decision [support] service system ... 42
2 A systems-based economic [decisioning] model ... 45
2.1 Cybernetics ... 48
2.2 Habitat master decision planning service ... 49
2.2.1 Habitat network operational processes, local and global ... 51
2.2.2 Habitat network conditions ... 52
2.2.3 Uncertainty ... 52
2.3 Branches of production [service] ... 52
2.4 Phased forms of production [service] ... 53
2.5 Flexibility of production [service] ... 54
2.5.1 Classes of production ... 54
2.6 Economic planning [service] ... 55
2.6.1 Rational economic decisioning ... 55
2.6.2 Logistics ... 56
2.7 Lifespan [service] ... 56
2.8 Life-cycle assessment [service] ... 57
2.8.1 Product life-cycle lifespan ... 58

2.9 Societal sustainability [service]........ 58
2.10 Self-organizing systems........ 60
2.10.1 Swarm resiliency protocols........60
2.10.2 Open protocol revisioning........61
2.10.3 Decisioning protocols........61
2.10.4 Collaborative protocols........61
2.10.5 Traceability protocols........62
3 An access-based economic [decisioning] model........64
3.1 Common heritage........ 65
3.2 Commons-oriented design principles........ 67
3.3 Two forms of societal-level access........ 68
3.4 Societal-level resource ("economic") configuring........ 68
3.5 Access sharing........ 72
3.6 Access-based in comparison to property-based........ 74
3.7 Induced demand........ 76
3.7.1 The manufacturing of demand........76
3.8 Responsibility and access........ 79
3.9 Wealth and access........ 80
3.10 Zero-sum games and access........ 80
3.11 Trust and access........ 81
3.12 Collectivist access........ 82
3.13 Access class separation........ 82
3.14 Access service interactions........ 83
3.15 Logistical resource access........ 83
3.15.1 Service inventories and catalogues........84
3.15.2 Time and service integration........84
3.16 Coordinated access to change logs through a digital ledger........ 85
3.16.1 Blockchain and the global information access network transfer protocol........87
3.16.2 Attacking the global information access platform........89
3.17 Identifiable information access........ 90
3.17.1 Anonymity and access........90
3.17.2 Privacy and access........91
3.17.3 Free expression and speech (access)........93
3.17.4 Observation as fulfillment and not surveillance (access)........94
4 A resource-based economic [decisioning] model........95
4.1 Historical context of a "resource-based economy" (RBE)........ 97
4.2 Economic stability........ 98
4.3 The global coordinated access system........ 99
4.4 The structured behavior of a resource-accounted system........ 99
4.5 True costs in a resource-accounted system........ 100
4.6 Moneyless fulfillment in a resource-accounted system........ 101
4.6.1 Structural goals and artificial scarcity........ 102
4.6.2 Simplified societal economic inner workings........ 103
4.7 Irreducible scarcity and resource-based accounting........ 103
4.8 Availability of access to human need fulfillment in a resource-based economy........ 104
4.9 Technology under resource-bound economic conditions........ 104
4.10 The scientific method and resource accounted economics........ 106
4.11 Utopia and the resource-based view........ 107
4.12 Power and community........ 107
4.13 Planned obsolescence........ 110
5 A participatory-based economic [decisioning] model........111
6 A market-State ownership and trade economic [decisioning]model (in contrast to community)........114
6.1 Trade........ 116
6.2 Ownership and property........ 118
6.3 What is property?........ 119
6.3.1 Title........ 120
6.4 What is land?........ 120

6.5 Property and movement over land ... 120
6.6 Mixing labour and property creation ... 120
6.7 Scarcity and property ... 123
6.8 The encoding of property ... 124
6.9 Structural violence, competition and property ... 124
6.10 Self-ownership and property ... 127
6.10.1 Self-ownership and slavery ... 128
6.11 Self-integrated, goal-oriented response (SIGOR) and self-ownership ... 130
6.12 The paradigmatic logic of self-ownership ... 131
6.13 The double coincidence of wants "problem" ... 131
6.14 Property delineations ... 131
6.14.1 Private property ... 132
6.14.2 Partnership property ... 132
6.14.3 Common "property" ... 132
6.14.4 Collective "property" ... 132
6.14.5 State property ... 132
6.15 Rights ... 132
6.15.1 The philosophers of capitalism and politics ... 133
6.15.2 Negative and positive rights ... 134
6.15.3 The revolutionary critique of rights ... 134
6.16 Limits of statute law ... 136
6.17 A further consideration of rights ... 136
6.17.1 Delegating rights ... 137
6.17.2 Property rights ... 137
6.17.3 Property rights and freedom ... 139
6.17.4 Access rights-control system ... 139
6.18 Property-oriented to access-oriented thinking ... 140
6.18.1 Access and not property ... 141
6.18.2 Utility and ownership ... 142
6.18.3 Cults and access control ... 142
Global Parallel Decision Resolution Inquiry ... 149
1 Decision accounting and inquiry ... 150
1.1 Global community unit accounting ... 152
1.1.1 Societal economic access calculation ... 154
1.1.2 Societal assembly complexity factors ... 154
1.1.3 Societal accessibility of assembly factors ... 159
1.2 A global decision system ... 161
1.2.1 Global decision inquiry accounting ... 162
1.2.2 Issue resolution ... 162
1.2.3 Issue resolution inquiry phases ... 164
1.3 Decision resolvability categorization ... 166
1.4 Variability/complexity reduction ... 166
1.5 Parallel issue inquiry ... 168
1.5.1 The integrator and comparator analysis structure ... 170
1.5.2 Parallel value inquiry ... 170
1.6 Stopping rules inquiry ... 171
1.6.1 Sequential probability ratio test (SPRT) ... 173
1.6.2 Selective stopping rules and p-hacking ... 174
2 Inquiry: Issue articulation ... 175
2.1 User survey inquiry ... 176
3 Inquiry: Issue recognition ... 177
3.1 Primary habitat operational processes ... 178
3.2 Incident categorization ... 179
3.3 Issue escalation ... 180
3.4 Systematically recognized and integrated needs ... 180
3.5 The triage process ... 181
4 Inquiry: Risks and concerns ... 183

4.1 Triage 185
4.2 Effectiveness check 185
4.2.1 Safety check 185
4.3 Resources space 186
4.4 Uncertainty space 186
5 Inquiry: Contribution 187
6 Inquiry: Feedback 187
6.1 Cybernetic feedback 188
6.2 Feedback types 188
6.2.1 Positive-failure analysis feedback 189
6.2.2 Negative-punishment as feedback 189
6.3 Neutral evaluation of material product as feedback 189
6.4 Feedback loops 189
Solution Inquiry Accounting 195
1 Solution accounting and inquiry 196
1.1 Solution optimization requirements 203
2 A solution [production] cycle 204
2.1 Solution [cycle] integrity 205
2.2 Socio-technical habitat service design 205
3 A real-world design-solution 206
3.1 The construction of a real-world solution 207
3.1.1 A real-world solution accounts for feasibility and viability 208
3.1.2 A real-world solution accounts for capacities (i.e., accounts for real-world limits) 208
3.1.3 A real-world solution accounts for networks 209
3.1.4 A real-world solution accounts for its unified composition 209
3.1.5 A real-world solution accounts for materiality 210
4 A documented solution 213
4.2 A standardized solution 214
4.3 A simulated solution 215
4.4 A solution specification 215
4.4.1 A specified systems definition 218
4.4.2 The purpose of a design specification 218
5 A system's life-cycle 223
5.1 Basic examples of life-cycles 223
5.2 The life-cycle of a real-world societal system 224
5.2.1 Societal systems have life-cycles 225
6 Design and production [control] method 226
Need and Preference Inquiry Accounting 231
1 Need and preference accounting and inquiry 232
1.1 The actual need of any issue 232
1.2 Preferences 232
2 The need inquiry 234
3 The preference inquiry 235
3.1 Residency need-preference 236
3.2 Aesthetic preference 237
3.3 Production preference 238
Access Inquiry Accounting 241
1 Access accounting and inquiry 242
1.1 Use value 243
2 Access profile 244
2.1 Profile access data 244
3 Product awareness 245
4 Access behavior 246

4.1 Product returns 246
5 Access designations 248
5.1 InterSystems access (system use) 249
5.1.1 Access levels 250
5.1.2 Certification 250
5.2 Community access (community use) 251
5.3 Personal access (personal use) 252
5.3.1 The personal information system 253
6 Socio-technical [life] phasing-in access to specific service-objects 254
7 Localization of access 255
8 Access prioritization 256
Technology Inquiry Accounting 259
1 Technology accounting and inquiry 260
1.1 What is technology? 260
1.1.1 What are tools? 262
1.1.2 Interoperability [of tools] 262
1.2 Technology sub-classification 262
1.3 Technology and morality 263
1.3.1 A simplistic look at how technology influences society 264
1.4 Technology quality assessment and assurance 264
1.4.1 Material selection for technology 265
1.5 Power parameters 265
1.6 Environmental operating parameters 265
2 The technology development matrix (TDM) 266
2.1 Technology application levels 266
2.2 Technology readiness levels 266
2.3 Technology obsolescence levels 268
2.4 Technology market readiness levels 268
2.5 Technology phasing and the infrastructure problem 268
3 Technical unit(s) accounting 268
3.5.1 Technical unit life cycle 271
4 Technical unit automation sub-inquiry 271
4.1 Automation benefits 271
4.2 Automation inquiry 271
4.3 Automation and InterSystem habitat service tasking 273
Resource Inquiry Accounting 279
1 Resource accounting and inquiry 280
1.1 User resource accounting 281
1.2 Material-resource typing 281
1.3 Material-resource surveying 282
1.3.1 Resource readiness quality level (RRQL) 282
1.4 Material-resource inquiring 284
1.5 Material-resource integrity 284
1.5.1 Surfaces 284
1.6 Material-resource societal integration 284
1.7 Material-resource quality control 285
1.8 Material-resource designation classifications 285
1.8.1 Allocation and availability designations 285
1.8.2 Energy analysis and designation 285
1.8.3 Substitutability 286
1.8.4 Scarcity analysis and designation 287
1.9 System input-output tables and analytics 288
1.10 Resource types 288
1.11 Resource information unit accounting 290
1.11.1 Economic resource accounting 291

1.11.2 *Resource application accounting* ... 291
1.12 Capacities ... 291
1.12.1 *All technologies have requirements for minerals* ... 292
2 Resource availability ... 293
2.1 Resource renewability and sustainability ... 294
2.1.1 *Factors of material renewability* ... 295
2.1.2 *Resource recycling* ... 296
2.2 Resource acquisition methods ... 296
2.2.1 *Mining* ... 296
2.3 Resource readiness matrix ... 297
3 Unified habitat heritage network planning of resources ... 298
3.1 The habitat technical unit resource inquiry ... 298
3.2 Resource life-cycle analysis visualization ... 300
3.3 Resource-based economic calculation ... 300
3.3.1 *Economic calculation inquiry using technical units composed of resources and labor* ... 300
4 Resource accounting for societal re-configuration ... 302
4.1 Resource transition planning ... 302
4.1.1 *Power production transitioning* ... 303
4.1.2 *Resource calculation and technical production unit calculation arc* ... 303
4.1.3 *In the early 21st century* ... 303
4.2 Resource efficiency analysis ... 303
4.3 Risks to transitioning using resources ... 304
5 Acquisition of resources ... 304
5.1 Mining for minerals ... 304
5.1.1 *Solid mineral resources* ... 305
Economic Calculation Inquiry Accounting ... 307
1 Calculation accounting and inquiry ... 308
1.1 Production calculation inquiry ... 311
1.1.1 *Centralized economic production planning* ... 313
1.1 Structural capacity ... 313
1.2 Computational capacity ... 315
1.3 Optimizational capacity ... 315
1.3.1 *Market pareto rule* ... 316
1.4 The economic calculation problem ... 316
1.4.1 *The economic rationality problem* ... 320
1.4.2 *The computer-power problem* ... 325
1.5 Economic technical unit planning and coordination ... 326
1.5.1 *Habitat sectorized service systems and common economics* ... 328
1.5.2 *Real-world, socio-technical planning* ... 330
1.5.3 *Complexity* ... 330
1.5.4 *Dynamic control and coordination* ... 331
2 Product coding (assembly identification) ... 332
3 Optimal resource allocation calculation planning and analysis ... 334
3.1 Computational economics in historical context ... 336
3.2 The linear economic calculation techniques ... 338
3.2.1 *Linear mathematical planning* ... 339
3.2.2 *The Kantorovich method of economic planning* ... 340
3.2.3 *Material flow analysis (MFA) econonmic planning:* ... 343
3.2.4 *Modified Leontief models for economic planning* ... 343
3.2.5 *Energy input-output analysis for economic planning* ... 343
3.2.6 *Adapted Haber (2015) heuristic action rating method for fundamental system functionality calculation economic planning* ... 343
3.2.7 *The harmony method* ... 346
3.2.8 *The agent-based modeling method for economic planning* ... 346
3.2.9 *The Samonthrakis method of economic planning* ... 346

3.2.10 Input-output models and time ... 348
3.2.11 The input-output model ... 349
3.2.12 Input-output tables ... 351
3.2.13 Input-output planning ... 351
3.2.14 Input-output analysis software ... 352
3.2.15 Input-output analysis (mathematical economics) ... 352
3.2.16 Closed input-output analysis model ... 352
3.2.17 Open input-output analysis model ... 353
3.2.18 The input-output analysis model in greater detail ... 354
3.2.19 A simplified hunter-gatherer economic example ... 357
3.2.20 Economic matrix operation to solve for the total demand ... 357
3.2.21 Economic matrix operation to solve for the total output ... 357
3.2.22 Economic matrix operation to solve for the allocation of a sector's output to a specific access type ... 358
3.2.23 Economic matrix operation for resource requirement calculation ... 359
3.2.24 Economic matrix operation for energy sector calculation ... 359
3.2.25 Economic matrix operation for resources ... 359
3.2.26 Human contribution calculation ... 360
3.2.27 Material balance planning ... 360
3.2.28 Network environmental analysis and planning ... 360
4 Optimal production design planning and analysis ... 361
4.1 Design efficiency and design optimization ... 361
4.2 Design calculation ... 362
4.2.1 The production calculation function ... 362
5 Assembly complexity index and analysis ... 370
5.1 Summation formula notation ... 374
5.1.1 Assembly complexity factoring ... 374
5.1.2 Exponential assembly complexity index analysis ... 375
5.1.3 Linear-complexity assembly index[ing] ... 376
5.1.4 Global habitat production assembly complexity index[ing] ... 377
5.1.5 Societal processes assembly complexity index[ing] ... 377
5.1.6 Product complexity assembly index[ing] ... 378
5.1.7 Concentration assembly index[ing] ... 379
Environmental Inquiry Accounting ... 407
1 Environmental accounting and inquiry ... 408
2 Environmental impact assessment deliverable ... 409
2.1 Assessment documentation ... 410
2.1.1 Environmental inquiry (causal-chain) assessment flow map/model ... 410
2.1.2 Stressors ... 413
2.1.3 Processes ... 413
2.1.4 Factors of reality-as-environment analysis ... 414
2.2 Sustainable materialization ... 416
2.2.1 Pollutionless materialization ... 416
2.2.2 Contamination materialization ... 417

List of figures

This is the list of figures within this document.
There are more figures associated with this standard than are identified in this document; those figures that could not fit are freely available through auravana.org, in full size, and if applicable, color.

Figure 1 This is the Real World Decision Resolution model, which shows decisioning elements in the real-world community model that lead to services, technologies, and behaviors that meet human fulfillment requirements. . . . 3
Figure 2 Deciding new material resolution through intentional evaluation of old material construction. . . . 5
Figure 3 Conceptual and spatial resolution of a common solution to optimal, mutual human life experience by means of resolving issues through contribution and project-engineering of the habitat and larger societal system. . . . 6
Figure 4 The Decision System high-level inquiry-view of the global decision protocol. Design solution inquiry model - availability to everyone on an equal basis.. . . . 7
Figure 5 The basic elements of a decision space (or decision system) with a fractal probability space on the right of the model. Here, a decision environment is resolved through the selection of one of several alternative solutions after the use of a method has been applied to integrate all relevant information and produce the alternatives.. . . . 41
Figure 6 Values orient a decision space for more accurately predicting future probable spaces, by means of actions generated as a result of decisions. Actions lead to different future probabilities, and reflections upon action may update values. . . . 43
Figure 7 Rational double-loop learning applied to decisioning in the real world in order to feed back information to improve the whole system.. . . . 45
Figure 8 Flow diagram depicting the mutual decisioning process that occurs in most team settings under community-type societal conditions. Team discuss issues. Teams propose information. Teams integrate information together. Teams test/question each other for consent, agreement, and understanding. Team members may or may not have objections. Proposals may be modified once concerns are explained. Actions are based upon achieved and agreed decisions.. . . . 47
Figure 9 A common kernel is designed and operated in order to solve for the optimal production of a life-cycling habitat service platform for humanity, developed and sustained by a working team.. . . . 49
Figure 10 Production and structure visualization. There are objects that are produced on some time-frame basis. Objects can be produced as individual items on a continuous, on demand, or on some cyclical, basis. Objects that become permanent (Read: continuous) structures within an environment can be produced/sustained continuously, on demand, or on some cyclical basis. Often, individual item objects that are produced via some service are used either used immediately (e.g., fresh food), held in a physical/digital library/catalogue repository, or held for some later pre-scheduled event in a repository. A repository (library) is a continuous structure.. . . . 51
Figure 11 This is a high-level flow-type chart of a linear process of: being presented with a problem that becomes and issue (on the left), which requires some set of understanding to design a solution (by comparison) in order to determine the finalized and single selection of a solution among those available, which are understood as completely as possible. And then, there is feedback upon whether or not the solution, when acted upon and/or operated resolved the problem as expected. An economy can be formalized and calculated as a matrix of informational

(conceptual) and material (numerical) systems. When there is sufficient information to input into (Read: to inform) an open software system, based on a deeper conceptual system, then decisions about the allocation of global resources become possible. When there is sufficient contribution, together with the necessary information, and the necessary accessibility of resources, then global economic planning becomes possible, if not probable. Global economic planning necessitates the acceptance and contribution to a global socio-technical standard of specification and operation. In the early 21st century, there are technical standards accepted to ensure the efficient and inter-operative nature of a technical society. Rights and other political standards and legislation govern, significantly, the social operation and potential adaptation of society. . . . 53
Figure 12 Conceptual framework of an input–output system. Three service systems are shown. These service systems take in resources (left system boundary). The service systems have two outputs: non-demanded outputs that are a byproduct of the service systems processes (a.k.a., wastes/emissions); these are connected to the top system boundary. These wastes/emissions may be inputs into other service systems, or they may be recycled or disposed of. Then, there are the demanded outputs of the service system (a.k.a., final outputs); shown at the right system boundary. (Tan, et al., 2018). . . . 73
Figure 13 Concept diagram depicting service systems with service priority (i.e., some services are prioritized) and service fulfillment (accountable degree of completion of service system demand). . 75
Figure 14 Habitat service subsystem decomposition model. . . . 77
Figure 15 Resource tracking within an access system. . . . 79
Figure 16 Access to resources and services through the re-organizational design of common heritage. . . . 89
Figure 17 A project coordinate where information is shared and resolved in order to sustain the continuous existence of an iterative societal system where all human individuals are mutually fulfilled. Together, humans may plan their informational and objective systems in order to generate greater states of well-being, fulfillment, and that which is desired. Life is reshaped through information and objective interaction. Life requires information and objective interaction.109
Figure 18 High-level view of decisioning within a habitat structure where human needs are fulfilled based on a priority of life, technology, and exploration services, to which resources are allocated. Herein, habitat configurations are decidedly selected based on a set of serial and parallel go/no go inquiry [threshold] processes that result in an operated habitat service system. Services within that habitat may be automated or manual, or somewhere in-between. . . 121
Figure 19 Simplified depiction of the market where ownership and trade occur. . . . 129
Figure 20 Depiction of the decision system threshold inquiry processes. This is a decision space where issues are articulated and solutions are resolved, whereupon a solution is selected for team/technician operation. Safety procedures exist herein. Here, values become encoded into the operation of society through their respective threshold inquiry processes. All societal-level algorithms and economic/resource calculation occur herein. . . . 149
Figure 21 The Decision System high-level conceptual coordination model. . . . 150
Figure 22 High-level concept diagram showing the serial and parallel inquiry processes of the decision system as they are presently known. There is a demand that is articulated into the information system where issues are recognized and decisions are solved into solutions, of which one solutions is selected to be operated as the configuration of the system.. . . . 151
Figure 23 The Decision System high-level conceptual integration model. . . . 153
Figure 24 This is the decisioning system inquiry supra-process for a community-type society. This is a decision system flow chart. Please refer to the project's website for the full size asset. . . . 159
Figure 25 Decision system integration into a societal-level [human] issue tracking system that generates, through contribution, a global team of habitat service system members who contribute to sustain a set of habitat service systems, which ultimately, sustain human fulfillment. . . . 161
Figure 26 The decisioning system inquiry processing model. . . . 163
Figure 27 Threshold [cap]ability to "go" (green) or "no go" (red). . . . 171
Figure 28 Icon representing a 'threshold'. In the icon, the arrow is moving downward and upon the third horizontal line down it reaches a threshold, which is indicated by the third line's downwardly concave shape. . . . 171
Figure 29 The four forms of habitat access occupation. . . . 243
Figure 30 The three forms of access Personal, Community, and Systems Access. . . . 247
Figure 31 The three forms of access designation in a community-type society are InterSystems access, common access, and personal access. . . . 249
Figure 32 Technology readiness level production/operation phase. . . . 267

Figure 33 The engineering of a real-world material cycle of resources for human "consumption" through team contribution. . . . 283
Figure 34 Accountable habitat service elements for calculation of resource allocation and automation. Diagram shows appropriate automation given an accounting of community services.. . . . 309
Figure 35 A simplified view of a matrix/table for habitat service (life, technology, and exploratory) inputs and outputs. Life support outputs are absorbed by other life support outputs, technical support services, and exploratory support services. Each service system is a service with associated resources allocated to products in that service. . . . 329
Figure 36 Model showing visual relationship between access designations and service design. . . . 345
Figure 37 Accountable dimensions for decisioning within a community-type society. A community-type society resolves decisions by accounting for organization of the system composed of a set of processes that sub-divisible by resource, access, and participation in a real world habitat service system.. . . . 347
Figure 38 Macro-economic calculation for production efficiency and distribution efficiency processes. . . . 364
Figure 39 Simplified macrocalculation for a global access network. . . . 365
Figure 40 Macro-economic calculation for maximization of total efficiency during the materials cycling process stages of design, production, distribution, and recycling.. . . . 367
Figure 41 Material cycle sustainability macro-calculation function. The four phases of the development of service systems with common resources are: design, production, distribution, and recycling. This is an optimization function for the maximization of efficiency in order to cycle materials sustainably throughout the habitat. This protocol combines with economic calculations and a parallel inquiry process in order to materialize service systems for the mutual fulfillment of all of humankind. . . . 368
Figure 42 Figure shows the matrices that must be designed and calculated for by the production decision protocol. . . . 369
Figure 43 Figure shows a three dimensional matrix for the production calculation. . . . 371
Figure 44 Diagram of the convergence of access, reconfiguration, and service through the allocation of resources with properties to specified locations. . . . 373

List of tables

This is the list of tables within this document.
There are more tables associated with this standard than are identified in this document; those tables that could not fit are freely available via the project's website.

Table 1 Accountable operational processes for coordination and control of habitat resources. 38
Table 2 **Decision System Classification**: The three decisioning processes in early 21st century society and their relative equivalences in community. Note that the three processes do not align exactly [due to a different direction, orientation, and approach] between early 21st century society and community. It may also be relevant to note that "decision making" is a key concept in "human management". Fundamentally, among community, we want to fix problems, we don't just want to advance decisions along some bureaucratic path.. 148
Table 3 **Decision System Classification**: The four transactional frameworks.. 148
Table 4 **Decision System Classification**: The Market Economy in comparison to a Resource-Based Economy.. 148
Table 5 **Issue Urgency Recognition**: Decision urgency/priority spectrum (in brief). This is a multi-layered view that includes associated operational processes.. 191
Table 6 **Issue Urgency Recognition:** Decision urgency/priority spectrum (in full). his is a multi-layered view that includes associated operational processes.. 192
Table 7 **Operational Issue Processing:** The coordinated focusing of relationships throughout the decision system.. 194
Table 8 **Decision System > Inquiry Solution**: Material element design attributes. 230
Table 9 **Personal Access Designations**: Personal information system sharing options. 257
Table 10 Technology application levels: from absent to stored. 266
Table 11 Technology readiness levels 1-9 with descriptions. 274
Table 12 Technology readiness levels with description, requirement, verification, and viability.. 274
Table 13 Technology readiness level index with definition, description, and results from. 275
Table 14 **Automation**: Alignment of level of robotic automation (involving decisioning and independent executability) with human autonomy. 277
Table 15 **Automation**: Service production automation types. 277
Table 16 **Decision System > Inquiry > Resources**: Renewable classification. 306
Table 17 **Decisioning > Decision Table Parts:** The parts of a decision table. 383
Table 18 **Decisioning > Decision Table Parts:** The parts of a decision table. 383
Table 19 **Decisioning > Decision Table Parts:** The parts of a decision table. 383
Table 20 **Decisioning > Decision Table Parts:** The parts of a decision table showing the if, then, else statement. The "IF" part are the conditions 1 ... n. The "THEN" part is the actions 1 ... n. Sometimes a decision table will contain an ELSE column at the far right. This is a single decision rule that essentially says that if any of the previous rules in table (to the left of the ELSE column) were not triggered, than take the action(s) specified in the ELSE column. This is a way of simplifying a decision table where only certain condition sets require specialized responses and all other conditions can be responded to with the same action. 383
Table 21 This table presents a highly simplified economy in terms of inputs and outputs. In this table, it says that 280,000 kilograms of corn seed plus 1,800,000 liters of fuel were used in the cultivation sector to produce an output of 14,000,000 kilograms. Here, there is a feed-forward relationship. Corn is used to make flour, flour is used to make final food-like substances, which is then consumed. Fuel is used everywhere. Production products are used everywhere. Labor is used everywhere. The final two columns (on the right) show final consumption by users. Labor is not applicable in the final physical consumption. Final physical consumption of fuel is 38,430,000. 638,666 flour for home baking. The value of flour is computed as 0.1.0 = (D3*C10+D6*F10+D7*G10+D8)/D9. This means (corn used * value corn + fuel used * value fuel + produces * value produces + labor)/output of flour. Iterative solving must be used on a spreadsheet to do this since values are recursively defined. 384
Table 22 **Decisioning > Simple Decision Table:** The left column is the stub portion. The c letter represents conditions (c1,c2,...) and the a letter represents actions (a1,a2,...). The top row is the condition portion; it is the requirements or rules. Each column in the entry portion is a rule (i.e., rule 1, 2, ...). Rules indicate which actions, if any, are taken for the circumstances indicated in the condition portion of the rule. In this example, when conditions c1,c2,c3 are all true,

then actions a1 and a2 occur. When conditions c1 and c2 are true, then action a3 occurs. The pattern continues forward in this manner.. 385
Table 23 **Decisioning > Simple Decision Table:** The parts of a decision table. This is illustrative of the decision system in this standard. 385
Table 24 **Decisioning > Decision Table Parts:** The parts of a decision table. 385
Table 25 **Decisioning > Decision Table Parts:** The parts of a decision table. 385
Table 26 **Decisioning > Decision Table:** A decision table showing the conditions (value alignment objectives), service systems, and service system solutions. The entries are fictitious. 386
Table 27 **Decisioning > Decision Table:** A decision table showing the conditions (design acceptability protocol), the acceptable actions (reject or accept), and a series of solution options from solution Case 1A to 3A. In this example, only 1 solution is acceptable, 2A. Only one solution passes all the inquiries:. 386
Table 28 **Decisioning > Decision Table:** An example decision table with the conditions (inquiries) as rows and the potential solutions as columns. The inquires are conducted on each solution, and the solution is scored.. 387
Table 29 **Decisioning > Decision Table:** An example decision table with the value alignment objective criteria to the left and the solution scores on the right.. 387
Table 30 **Decision System > Resource-Based > MacroCalculation**: The resource-based logical design calculation table. 388
Table 31 **Decision System > Resource-Based > MacroCalculation**: The calculation table for optimal labor-automation.. 389
Table 32 **Decision System > Resource-Based > MacroCalculation**: The calculation table for optimal durability.. 389
Table 33 **Decision System > Economic Calculation Planning > Quadrant View:** A complex input-output flow table showing its basic four quadrant view (square n*n) of inputs and outputs for high-level visual comprehension of statistical operations to be completed on accountable quantities in order to produce economic calculation results useful for decisioning purposes.. 390
Table 34 **Decision System > Economic Calculation Planning > Simple Input-Output Table:** A simple economic input-output table example.. 390
Table 35 **Decision System > Economic Calculation Planning > Resource and Sector View:** The generalized case of an input-output matrix; wherein, x_i are resources or products, y_i is a sector of the economy (e.g., habitat service system), $\sum_i x_i$ is the total output produced in sector i, $\sum_i y_i$ are the total amount of resource x_i used in production across sectors. 390
Table 36 **Decision System > Economic calculation Planning > Balancing:** Input-output table planning necessarily involves material balance planning of rows as well as column balance planning. 390
Table 37 **Decision System > Economic Calculation Planning > Service System Input-Output View:** Basic structure of an economic input-output table for [habitat] service systems. 391
Table 38 **Decision System > Economic Calculation Planning > Technical Interdependence:** Input-output table shows the technical interdependence between service systems in a given environment.. . . . 391
Table 39 **Decision System > Economic Calculation Planning > Service System Input-Output View:** Basic structure of an economic input-output table for access by users to the service and object (goods) outputs of habitat service system sectors immediate and intermediate services and technologies (productions). 391
Table 40 **Decision System > Economic Calculation Planning > Material Cycling:** Material cycling input-output economic table.. 392
Table 41 **Decision System > Economic Calculation Planning > Environmental Economics:** Environmental economics (a.k.a., eco-habitat economics). Material resources flow are measured along the rows. Activities are measured in the columns. 392
Table 42 **Decision System > Economic Calculation Planning > Input-output:** Input-output economics base square table.. 392
Table 43 **Decision System > Economic Calculation Planning > Decisioning > Simplified Input-Output Economic Table:** A simplified input-output table for a habitat-based economic system where habitat sectors are prioritized and patterns of demands are processed as intermediary requirements for resources to produce (as sectors) services and objects for the optimal and mutual fulfillment of all users by means of computation therein.. 392
Table 44 **Decision System > Economic Calculation Planning > Leontief Open and Closed:** This is an example of a Leontief closed table and open table.. 393
Table 45 **Decision System > Economic Calculation Planning > Accounting:** Simplified resource and process accounting table. 393

Table 46 **Decision System > Economic Calculation Planning > Simplified Matrix Model:** The following is a highly simplified example of a economic matrix (input-output) model. 393
Table 47 **Decision System > Economic Calculation Planning > Simplified Economic Plan:** The following is a highly simplified example of a simplified closed and planned economy, where distribution occurs from coal, electric, and steel, and is entirely used by coal, electric, and steel. 393
Table 48 **Decision System > Economic Calculation Planning > Data Flow:** An economic system can be viewed as a table of data about access to need fulfillment based upon units of some operation. . 394
Table 49 **Decision System > Economic Calculation Planning > Natural User Economics:** An input-output table showing natural resources and demand within a community-type society where access is split three-ways: between intersystem teams (contributors who sustain and adapt the society); common [city] access (the city/habitat service commons); and, personal access. 394
Table 50 **Decision System > Economic Calculation Planning > Simple Input-Output Habitat Access and Allocation Table:** This is a simplified input-output table example of access and allocation within a habitat service system with priority designation and final community demand. The sectors of the economy are those fundamental to a habitat service system. The economy can be summarized by taking the last column: $X = x_1 + x_2 + x_3 + L_1 + L_2 + L_3$; or, taking the last row: $X = x_1 + x_2 + x_3 + dc + dp$ 395
Table 51 **Decision System > Economic Calculation Planning > Simplified Matrix Model:** The following is a highly simplified example of a economic matrix (input-output) model. 395
Table 52 **Decision System > Economic Calculation Planning > Simplified Matrix Model:** The following is a highly simplified example of a economic matrix (input-output) model. 396
Table 53 **Decision System > Inquiry > Economic Calculation Planning > Decisioning > Impact-Probability**: Example of a qualitative matrix, a risk matrix. All qualitative matrices also have quantitative components (see: 1, 2, 3, 4), which are necessary for performing statistical/mathematical operations on the matrix in order to derive more useful data. Qualitative matrices exist in contrast to quantitative matrices, such as Leontif input-output matrices. 396
Table 54 **Decision System > Economic Calculation Planning > Decisioning > Human-Habitat Priority:** The following is a highly simplified example of service sector priority in an real-world habitat economy where humans. Here, a lower priority value is of a higher importance to human need fulfillment. 396
Table 55 **Decision System > Economic Calculation Planning > Material Cycling:** Material cycling input-output economic table. All inputs are consumed by all outputs. It is possible to think of individuals (subjects, agents, users, etc.). 396
Table 56 **Decision System > Economic Calculation Planning > Service System Input-Output Access Planning Matrix:** This is an access matrix for a unified habitat service system where there are three primary (economic) habitat service systems (sectors) and three forms of access to the inputs and outputs of those service systems. Basic summations for an input-output table for [habitat] service economic systems. $Z_{i,j}$ represents the quantity of some unit or value in each sector. The first three rows represent sectors dedicated to production of habitat services. The fourth row is a sum total of the rows above. The columns indicate the requirement for (i.e., value of/demand for) the service sectors. The final right column is the total outputs of all sectors, and its total sum. Wherein, pers. (is personal access), com. (is common access), and tea. (is team access). 397
Table 57 **Decision System > Economic Calculation Planning > Simple Input-Output Table:** Another simple economic input-output table example.. 397
Table 58 **Decision System > Economic Calculation Planning > input-output table:** Simplified version of an economic input-output table showing resources moving into and out of sectors for a value oriented final demand. 398
Table 59 **Decision System > Economic Calculation Planning > Service System Input-Output View:** Basic summations for an input-output table for [habitat] service economic systems. $z_{i,j}$ represents the quantity of some unit or value in each sector. The first three rows represent sectors dedicated to production of habitat services. The fourth row is a sum total of the rows above. The columns indicate the requirement for (i.e., value of/demand for) the service sectors. The final right column is the total outputs of all sectors, and its total sum. 398
Table 60 **Decision System > Economic Calculation Planning > Products and Sectors Matrix:** This is an example of a product and sector matrix. 399
Table 61 **Decision System > Economic Calculation Planning > Service Object Sector Access:** Table showing two sectors (Life and Tech) and final user demand for service-objects. 399
Table 62 **Decision System > Economic Calculation Planning > Decisioning > Matrix Operations:**

Simplified view of the operation, input, and outcome of the three functions of addition (and subtraction), scalar multiplication, and matrix product. 400
Table 63 **Decision System > Economic Calculation Planning > Decisioning > Matrix Operations:** Two matrices are shown, W and W' (a.k.a., W prime). W' is the inverse of W. The identity matrix is shown in quadrant 2 of matrix W and Quadrant 3 of matrix W'. 400
Table 64 **Decision System > Economic Calculation Planning > Habitat Service Flows:** Simplified input-output table of a community-type habitat service system for human life, technical, and exploratory fulfillment. The economic sectors are: Life, Technology, and Exploratory. The primary sub-system services are shown for each of the top-level economic sectors for a community-type society. 401
Table 65 **Decision System > Economic Calculation Planning > Habitat Sector Components:** Table show the primary service sector components of the three primary habitat services. 402
Table 66 **Decision System > Economic Calculation Planning > Global Habitat Cities and Services 403**
Table 67 **Decision System > Economic Calculation Planning > Global Habitat System 404**
Table 68 **Decision System > Economic Calculation Planning > Global Habitat System:** Table showing habitat service system outputs to the three types of access: 1) team access to the habitat service contribution system; 2) User demanded access to common and personal objects and services (or, products). 405
Table 69 **Contribution**: Tasking contribution status.. 406
Table 70 **Contribution**: Tasking contribution status.. 406
Table 71 Simplified strengths, weaknesses, opportunities, threats (SWOT) matrix. 418
Table 72 Strengths and weaknesses, threats and opportunities (SWOT) matrix for analysis of events, scenarios, and strategies in concern to their impact certainty and impact scale. 419

Document Revision History

A.k.a., Version history, change log.

This document is updated as new information becomes available.
The following information is used to control and track modifications (transformations, changes) to this document.

VERSION	REVISION DATE	SUMMARY (DESCRIPTION)
003	May 2024	The structure of this document has changed significantly; significant changes have been made throughout this document. This document is now organized around the decision protocol, with an introduction to decisioning, decisioning in community, and the elements of a community-orienting parallel decision inquiry process (separated by article). Citations have been improved throughout and are now at APA 7th generation.

GENERATION ON	NAME	CONTACT DETAIL
May 2024	Travis A. Grant	trvsgrant@gmail.com

The Decision Service System Overview

Travis A. Grant,

Affiliation contacts: *trvsgrant@gmail.com*

Version Accepted: 1 April 2024

Acceptance Event: *Project coordinator acceptance*

Last Working Integration Point: *Project coordinator integration*

Keywords: societal decisioning, societal decision system, decision system, socio-technical decisioning, issue resolution, statistical service support, intelligence services, distributive justice operation plan, governance system, economic system, socio-economic decisioning

Abstract

This publication is the Decision System for a community-type society. A decision system describes the formal structuring of decisions involving a comprehensive information system that resolves into a modification to the state-dynamic of the material environment. A decision system is a collection of information-processing components -- often involving humans and automation (e.g., computing) -- that interact toward a common set of objectives. This decision system is designed to coordinate and control the flow of resources for global accessibility to all goods and services. To navigate in common, humanity must also decide in common. Herein, individuals maintain a relationship to resources that focuses on access rather than possession, maximizing the advantages of sharing, and incentivizing cooperative, rather than competitive, interest. All requirements relevant to human fulfillment and ecological well-being are factored in to the allocation of resources, optimizing quality-of-life for all, while ensuring the persistence of the commons. The standard decision processes produce tasks that are acted upon by an intersystem (a.k.a., interdisciplinary) team involving the coordinated planning and operation of projects. Through this comprehensive and transparent decisioning process individuals know precisely what needs to be accomplished to sustain and evolve their fulfillment. Herein, through formalized decisioning and cooperation humanity may continuously restructure society toward a higher potential dynamic of life experience for all. The use of a common social approach and data set allows for the resolution of societal level decisions through common protocols and procedural algorithms, openly optimized by contributing users for aligning humanity with its stated values and requirements. The direction of a decision system is determined by the creation and execution of directional project sub-lists: needs, objectives, requirements, etc..

Graphical Abstract

Image Not Yet Associated

1 A decision

A.k.a., A decision event, a decision context, a decision solution, a decision directive.

A decision is a conceptual space within which one of two or more feasible alternatives is selected; denoting a process of "deciding". Typically, an alternative is selected based upon it having (1) the highest probability of success or effectiveness or (2) best matching with a particular vector/directional factor(s), such as a goal, objective, or value. A decision can resolve into a determined course of action [an action], a preference, or an assumption. The space that a decision holds (i.e., the decision domain) ends once a selection of the alternative options occurs and is chosen. A decision is created and a "decision space" opens when an answer to a particular problem, issue or question is sought; all decisions requires a question, an issue. However, some decisions do not involve a problem. In other words, all problems involve a decision, but not all decisions involve a problem. For example, deciding whether to prefer to eat dark chocolate or milk chocolate is not, in and of itself, a problem frame; but, it is a decision. Deciding how many dark chocolate bars to milk chocolate bars to manufacture does represent a problem frame. Decisioning is a means of controlling the influence of an outcome; all decisions (solutions) result in directives (inclusive of action-based directives and/or inaction-based directives).

A decision is a [conscious-intentional-will] determination of one option (outcome) as being optimal for some reason. For intelligent life forms, this generally comes after a space of thought [decision space visual resolution] (i.e., cost/benefit analysis, key performance assessment, etc.), which relies upon some previous experience, knowledge and/or critical exposure. Some action must be taken towards realizing the choice being taken -- a decision is: made, selected, arrived at, etc. The objective determination of a choice being taken is reliant upon some observable difference relative to the pre-choice state. The only evidence of a choice is some subsequent action, which can be observed as a "will" to action (to act one's body in a particular way in the material environment).

All decisions are decided upon within a 'decision environment' (or 'decision space'), which is defined as the collection of information, alternatives, tools, and deciding factors (e.g., goals and values) available at the time of the decision. The decision environment is bounded by these elements. And, when these bounds are "resolved" through a clarification of the information, then the decision space "resolves". Therein, values and approaches (a.k.a., strategies) orient decisioning (i.e., are part of the construction of a decision environment).

Decisions within an environment determine the potentials available to the deciding entity. An ideal decision environment would include all possible information relevant to the decision, all of it accurate, and every possible alternative. Hence, the information-gathering function of the decision process is of great importance. Because decisions involve a bounded environment, it may be stated that the major challenge in deciding is that of probability, and a major goal of the deciding entity is to reduce uncertainty by gathering more accurate information. The process of deciding generally involves sufficiently reducing uncertainty (or doubt) about alternatives to allow for the selection of the most reasonable, rational, and valued alternative based on the information available. However, for most decisions uncertainty is reduced rather than eliminated. Very few decisions are made with absolute certainty because complete knowledge about the entire universe of alternatives is seldom possible. If there is no uncertainty, then all information leading to the optimal decision must already be present.

The concept of a decision allows for the selection of an option based upon both subjective and objective means. Objective decisions apply a set of objective tools (e.g., criteria, model, process, or strategy) for structuring and analyzing a decision. Subjective decisions often involves the contextual emotional state of the decider and may be based on incomplete or inaccurate information, or cultural and personal biases/opinions. Objective decisions may also, though not necessarily by intention, be based on incomplete or inaccurate information.

The act of deciding can be characterized in two distinct ways: (1) arriving at a decision [possibly involving an objective process] or (2) making a determination while discarding all other options by choosing through a contextually subjective or biased emotional state. Notice the two italicized words, "making" and "arriving". These words establish different orientational perspectives toward the decision process.

Every decision is process, with an:

1. **Event**, within a
   A. **external issue and internal resolution context**, resulting in a
      1. **solution design and solution selection** (Read: decision choice), resulting in a
         i. **directive** (a.k.a., direction, decision directive), resulting in
            1. **expectation** of action or in-action.

A decision process may result in one of the following outcomes:

1. Terminate in a selection of one of an available set of choices.
2. Fail to terminate in the selection of one of the available choices, and terminate its continued active status (Read: close).
3. Fail to terminate its continued active status, and go on continuously using resources.

There are a set of basic types of decisions, there are:

1. One time decisions (not real-world).
2. Repeated cyclical decisions with inertia (as in recurrent decisions, habits).
3. Complex of decisions (with multiple variables and a sequence of choices; real-world).
4. Pre-determined decisions (as in, procedures, protocols, and algorithms/programs).

> **NOTE:** *It is through our choices that we grow, and if we are ignorant of the context how can we grow.*

In order to optimally take any decision a set of axiomatic tasks must be completed (note that each of these task represents a series of sequential decisions over time):

1. **Identify the decision [problem]** for which a choice must be taken.
2. **Collect information** in order to visualize, understand, and take/make an informed analysis.
3. **Analyse the collected information** in order to actually visualize, understand, and take an optimal decision.
4. **Take a decision** (i.e., make a selection, make a choice, take a choice, select or not a solution) from the available set of solutions/choices.

When humans take decisions, their brains go through a six-stage cycle to allow them to process and react. The decisioning cycle is as follows:

1. Baseline state (baseline conditions state).
2. Novel stimuli (starting the process; issue-status and problem-state).
3. Problem-solving analysis - decision inquiry and

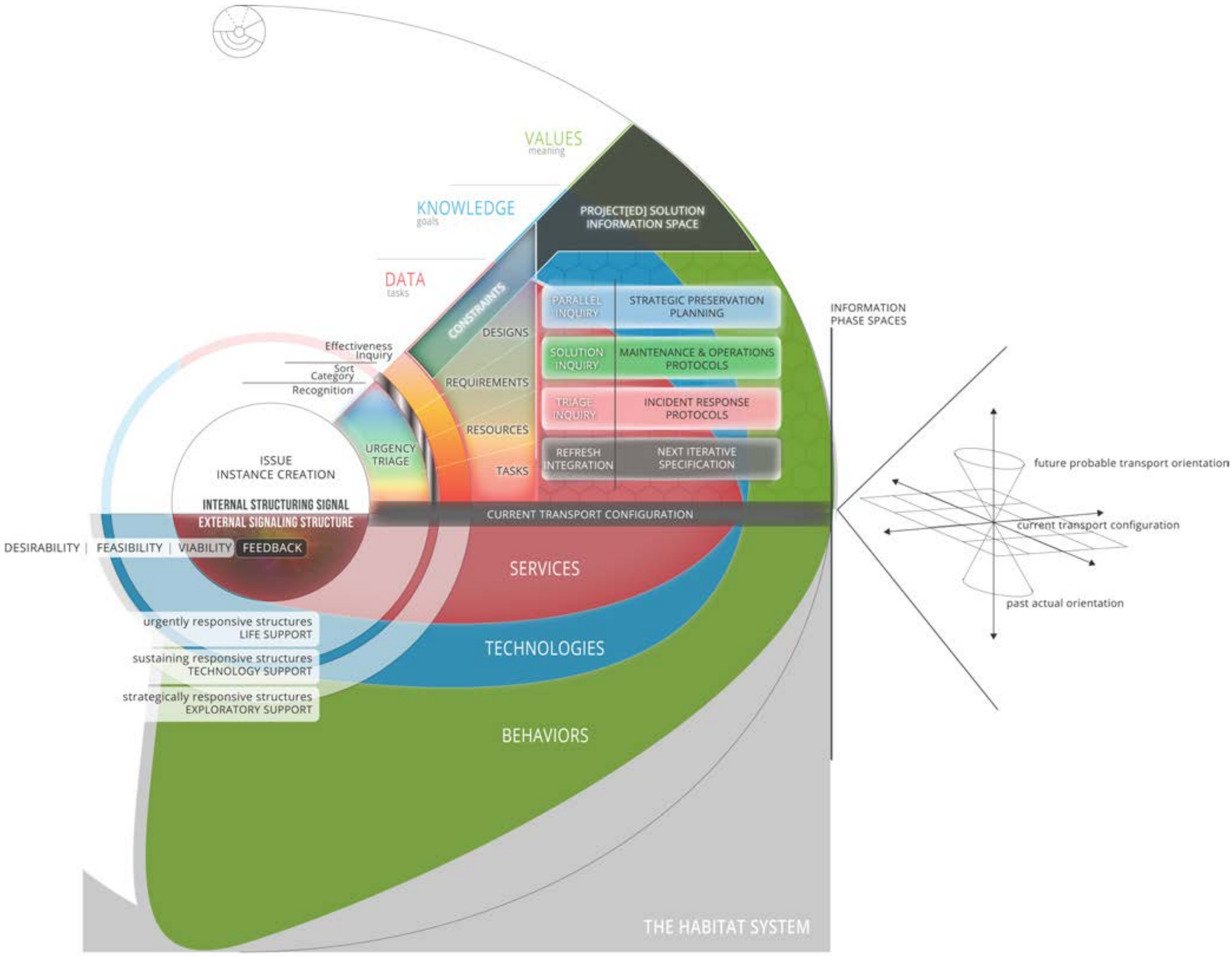

Figure 1. *This is the Real World Decision Resolution model, which shows decisioning elements in the real-world community model that lead to services, technologies, and behaviors that meet human fulfillment requirements.*

resolution produces some quantity and quality of decision option selections. Quantity and quality in relation to that which the user (with the issue) needs (and prefers) in order to have [human] fulfillment.
4. Pre-action readiness - contribution, training, and solution initialization.
5. Action - interface and reconstruct with an environment, so that it more greatly aligns with the objective of the decision that was taken about some issue.
6. Post-action evaluation (and back to Baseline) - how well did the decision lead to global human need fulfillment (and preference).

This decisioning procedure is common to human neurology, and can be operationalized to facilitate decisioning for a whole population.

> **INSIGHT:** *Access to more accurate information provides the opportunity, the probable possibility of moving into a different perspective.*

1.1 Contextualizing a decision via an overview of possible decision scenarios

> **INSIGHT:** *Everyone takes decisions all the time throughout life.*

The following are the primary axiomatic categories of decision an entity can take at the societal-level:

1. A human [self] takes a decision:
   A. A user takes a decision.
      1. A family is a mixture and dynamic of close and loving individuals, which typically involves individuals in different phases of their life.
      2. A user in education phase [of life].
      3. A user in leisure phase [of life].
      4. A contributor takes a decision (a user in contribution phase) [of life].
2. A decision [for a human self] is taken by "proxy" (i.e., by representation based on pre-specified agreement):
   A. The proxy can be proxy through agreement over,
      1. a specific educated area of expertise, for certification.
      2. a specific political election to authority, for command over force.
      3. a pre-designed programmatic solution (e.g., procedure, software application), for co-creation of the next version of community, its information system and its local habitat, regional habitat and a global habitat service system.
      4. the availability, trustworthiness and overall efficiency of [artificial] intelligence (i.e., because AI is available, trusted, and can do it most efficiently).

There are several types of scenarios in which decisions are taken [in the context of decision theory] by one or more deciding entities:

> **NOTE:** *More than one scenarios/situations can be present at the same time.*

1. **Simultaneous choice (a.k.a., obscured simultaneous choice, hidden concurrent choice, etc.):** In this scenario, different unique decision-takers select choices at the same time without knowing the choices of others. Note here that game theory often deals with simultaneous choices, especially in situations like the Prisoner's Dilemma and other strategic interactions. In any competitive game there is [likely to exist] the obfuscation/secreting of choice, in order to acquire and/or maintain competitive advantage.
2. **Sequential decisioning (a.ka., sequential decision making, sequential choosing, sequential games, etc.):** sequential decisioning has two different sub-definitions:
   A. Sequential decisioning refers to a scenario where deciders take choices in a specific order, taking into account the actions and decisions of previous deciders.
      1. Decision scenarios with feedback: In some decision processes, feedback informed (and analyzed) from earlier choices can influence subsequent decisions. Adaptive control systems and learning algorithms often deal with such scenarios.
   B. Sequential decisioning also refers to a situation where the deciders takes/makes successive observations of a process, and analyzes the observations, before a final decision is taken. The essential decision in a situation with sequential choice is not which alternative to choose, but when to stop acquiring additional information and commit to the leading alternative. In most sequential decision problems there is an implicit or explicit resource usage/cost associated with each observation. The procedure to decide when to stop taking observations and when to continue is called the ‘stopping rule.’ The objective in sequential decision making is to find a stopping rule that optimizes the decision in terms of minimizing losses or maximizing gains, including

observation costs. The optimal stopping rule is also called optimal strategy and optimal policy (Saad et al., 1996).

3. **Single-stage decisions:** These are one-time, isolated decisions where there is no subsequent decisioning (for some extended duration of time). For example, deciding whether to buy a product (in the market), choose a career (in the market). Note: there are no single stage decisions at the societal-level of decisioning.
4. **Multi-stage decisions (a.k.a., progressive decisions):** Unlike single-stage decisions, multi-stage decisions involve a series of interrelated choices. These decisions often involve a sequence of actions and typically occur in a specific order, similar to sequential choice scenarios. Examples include project planning, supply chain management, and investment strategies.
5. **Uncertainty and sequential action decisioning (a.k.a., markov decision processes (MDPs)):** In In this scenario, deciders identify a series of states, actions, and transitions between states. Each action affects the probability of transitioning to a future state and accumulates benefits/rewards or harm/costs. Uncertainty and sequential action scenarios are resolved in large part through decision modeling and a well-defined mathematical framework. The active processes during these types of decisions are commonly used in fields like reinforcement learning, robotics, and optimization.
   A. **Uncertainty and control problems (a.k.a., stochastic control problems)**: A scenario that involves making decisions under uncertainty and the control of stochastic processes (Read: randomly evolving processes). In the real-world, all societal decisions are taken under a scenario where there are risks and degrees of contextual and knowledge uncertainty.
   B. **Reinforcement learning (RL)** : A scenario that involves processes where agents take decisions to maximize cumulative benefit/reward. Reinforcement learning is the method of developing machine intelligence (a.k.a., artificial intelligence, AI). Here, the question is, what signal, and beneficial evolutionary behaviors, are being reinforced? Common reward in community are utility and efficiency. The common reward in the market is money. The common Reward in the State is authority/power-over-others.
6. **Dynamic programming**: A scenario that involves dynamic programming refers to a set of software programming techniques to solve and optimize a decision process over time, using the following data sets:
   A. **Subproblem decomposition:** Decompose a complex decision problem into a sequence of smaller sub-problems, which generally correspond to decisions about a sequence of actions and states.
   B. **Optimal substructure:** The "optimal substructure," refers to the optimal solution to the problem, constructed from the optimal solutions of its subproblems.
   C. **Storing accessing:** All decisioning requires the storing and reusing of solutions to subproblems to avoid redundant calculations.
      1. **Memoization:** When a subproblem is solved, its solution is cached in a data structure, such as a dictionary or a memoization table. The solution is stored with an associated key that represents the input to the subproblem.
         i. **Recursion:** is breaking a problem into sub-problems and solving the sub-problem as part of the total/integrated solution.

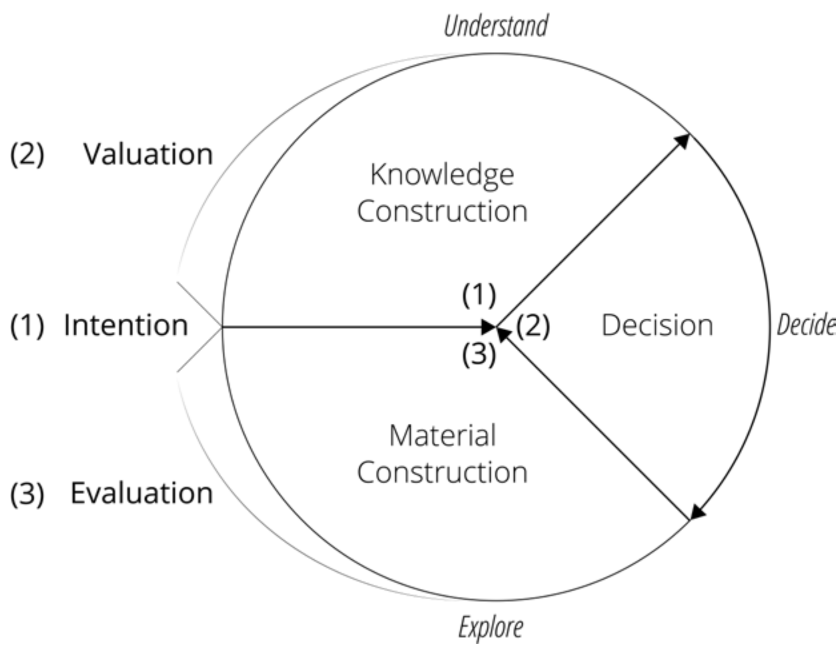

Figure 2. *Deciding new material resolution through intentional evaluation of old material construction.*

It starts with the original problem and breaks it down into sub-problems, which are solved recursively. In a recursive system, which are combined:

1. **Base case:** the base case represents the simplest form of the problem, which can be solved directly without further recursion. It serves as the termination condition for the recursion. Without a base case, the recursion would continue indefinitely, leading to a stack overflow or infinite loop.
2. **Recursive case:** The recursive case represents the part of the problem that can be divided into smaller subproblems. The recursive function calls itself with a modified version of the problem (a smaller instance of the same problem) until the base case is reached.
3. **Combining solutions:** Once the base case is reached, the recursion "unwinds" (a.k.a., recursion unwinding, recursion stack unwinding, or recursion termination) as the solutions to the subproblems are combined to form the solution to the original problem. The solutions to the subproblems are typically combined using a predefined logic or formula.
   Recursive functions call themselves to solve subproblems. A recursive function has a stack. Each recursive call adds a new level to the call stack, which can lead to stack overflow errors if the recursion goes on too long.
2. **Tabulation:** When a solution is solved for a sub-problem, the system creates a table or array (often called a tabulation table, DP table, etc.) to store the solution for the sub-problem. The table is filled in a systematic way, starting with the simplest subproblems and using their solutions to build solutions to more complex subproblems. Tabulation uses a table or array to store intermediate results. There is no risk of stack overflow, making it more memory-efficient.
3. **Retrieval:** Before solving a subproblem, the algorithm checks whether a solution

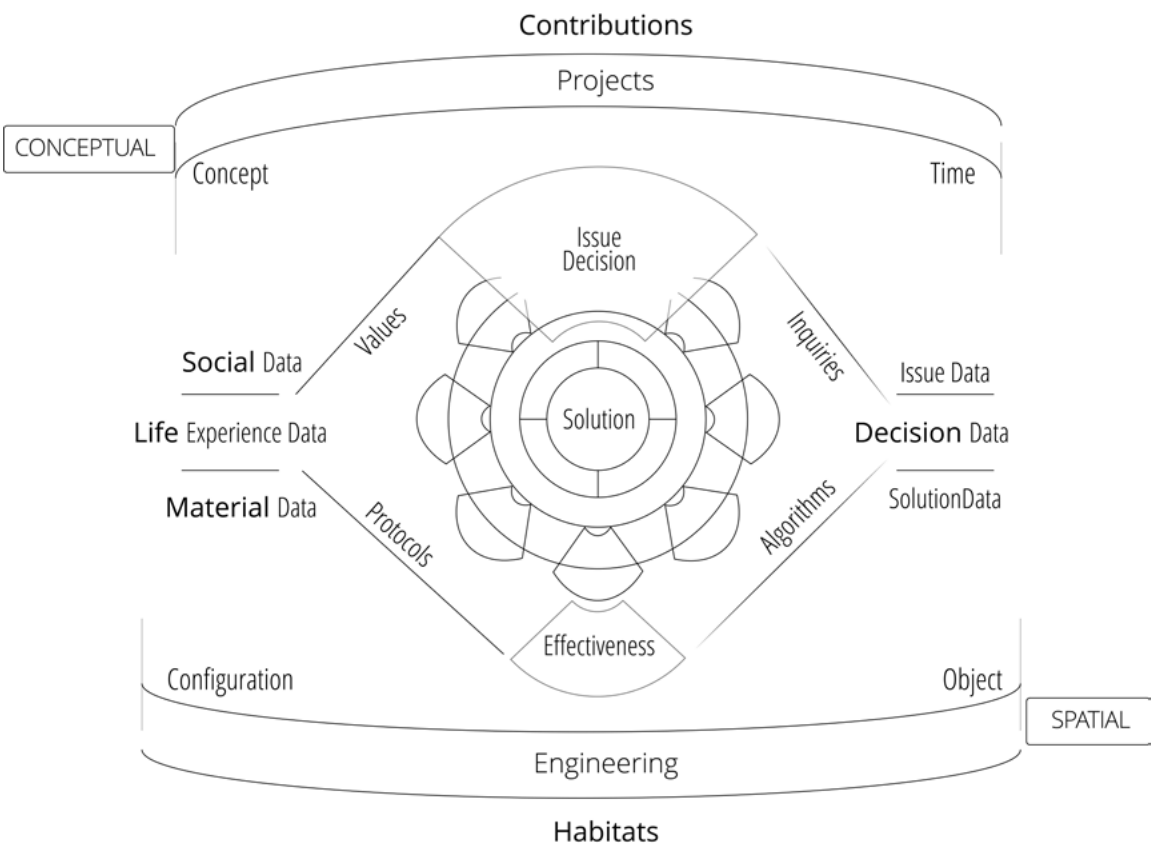

Figure 3. *Conceptual and spatial resolution of a common solution to optimal, mutual human life experience by means of resolving issues through contribution and project-engineering of the habitat and larger societal system.*

for that specific subproblem already exists in the cache. If it does, the cached solution is returned instead of recomputing it. It is typically implemented using a recursive algorithm, where the function or algorithm makes calls to itself.

7. **Optimization decisions:** The goal of dynamic programming is to optimize a particular objective function. Typically, the objective of any decision [at a societal level] is often to maximize expected cumulative benefits (as in, rewards) for humanity and to minimize harms/costs over time by finding the optimal solution iteratively.
   A. **Temporal aspect:** "Over time" refers to the sequential nature of the decision process. Decisions are taken along a number line (Read:

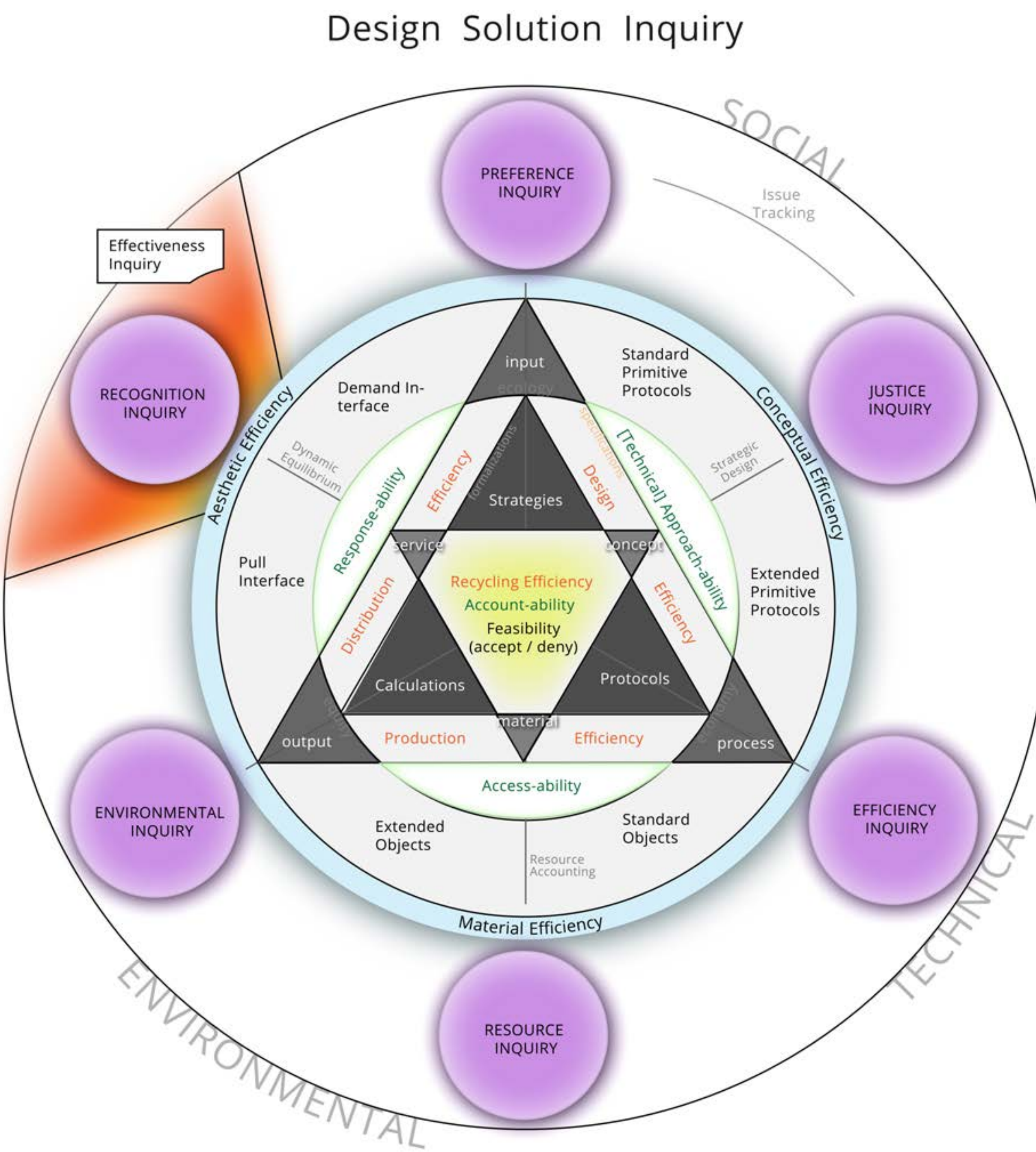

Figure 4. *The Decision System high-level inquiry-view of the global decision protocol. Design solution inquiry model - availability to everyone on an equal basis.*

sequencing of numbers, as events/points along a "time"line).

B. **Deterministics (a.k.a., linear algebra, linear programming, deterministic mathematics):** Linear algebra is used to model and solve linear programming problems. Decision variables and constraints can be represented in matrix form, and optimization techniques, such as the simplex method, involve matrix operations. Linear algebra is the mathematics of vectors and matrices. Network flow problems involve the efficient allocation of resources, wherein matrices are used to represent flow, costs, and capacities. Matrix manipulations are used to find optimal flow solutions. Matrices are used to represent the flow of goods and services in supply chain and logistics problems, with matrix algebra helping optimize routes and schedules. Here, given a set of inputs, there is only one correct answer to a linear algebra problem. All algebraic sourced information (i.e., algebra, geometry, trigonometry, calculus) has a certain [correct] answer. In algebra, every variable has a certain value, whether it is known or not. All algebraic math problem-solutions are programs.

1. **Linear algebra matrices:** The linear algebra matrix represents linear transformations and enables the performing of algebraic operations on vectors and scalars. Linear algebra matrices are used in various fields to represent transformations, solve systems of linear equations, find eigenvalues and eigenvectors, perform matrix multiplication, and more. Linear algebra matrices do not necessarily represent statistical relationships or covariances between variables. They can represent a wide range of mathematical operations and transformations, depending on the context. Linear algebra matrices are commonly orthonormal. Orthonormal matrices are used to represent orthonormal bases and orthogonal transformations, and their rows (or columns) are orthonormal vectors with a magnitude of 1. To be orthonomal, a matrix must be both orthogonal (in that two vectors are perpendicular to one another and dot product is zero) and normal (the vector has a unit length of 1 whole unit).

C. **Probabalistics (a.k.a., statistics, statistical programming, probabilistic mathematics, stochastic mathematics, randomness mathematics):** Statistics is the mathematics of probabilistic or stochastic systems. Statistical mathematics is used to model and solve data set pattern questions, including: mean, median, mode, spread of observations ("standard deviation") and significance (Read: "p-value"). Here, uncertainty quantified. In statistics, all variables have distributions. The values are all able to be pointed on a graph, sometimes finite, and sometimes not. Statistics is the field of study that deals with collecting, analyzing, interpreting, presenting, and organizing observed data. It includes techniques for summarizing and drawing conclusions from one or more observation input as data.

1. There are several general, overlapping, types of statistics:
   i. **Probability statistics:** summarizes and describes uncertainty and randomness.
   ii. **Descriptive statistics:** summarizes and describes data with observed measures including: means, variances, and distributions.
   iii. **Predictive (inferential) statistics:** summarizes and describes confidence of a statement after sampling a population, including hypothesis testing, confidence intervals, and regression analysis.
   iv. **Multi-variate statistics:** A technique that summarizes and describes multiple variables
2. **Principal component analysis (PCA)** - a technique that is categorized under "multivariate statistics," and is commonly used [in statistics and data analysis] for reducing the dimensionality of data. PCA accomplishes dimensionality reduction by identifying new variables, known as principal components, that are linear combinations of the original variables. Reducing dimensionality refers to the process of decreasing the number of variables or elements in a dataset while retaining the most essential information and patterns. Other dimensionality reduction techniques are: singular value decomposition (SVD), t-distributed stochastic neighbour embedding (t-SNE), etc. The principal phases of PCA capture the most important patterns and variances in the data:
   i. **Centering the data:** The first step in PCA is often to center the data by subtracting the mean of each variable from the data points. This ensures that the data is centered around the origin.
   ii. **Covariance matrix (a.k.a., matrix in statistics, variance co-variance matrix,**

co-variance matrix): PCA relies on the covariance matrix of the original data. The covariance matrix describes the relationships between pairs of variables and is a measure of how variables change together. A covariance matrix is a square matrix that represents the pairwise covariances between variables in a dataset. Each element of the matrix corresponds to the covariance between two variables. It contains variances on the diagonal and covariances off-diagonal. The covariance matrix is a square matrix where the diagonal elements represent the variances of individual variables, and the off-diagonal elements represent the covariances between pairs of variables. The diagonal elements of the covariance matrix represent the variances of individual variables, indicating how much they vary from their means. The off-diagonal elements represent the co-variances, showing how pairs of variables vary together. Covariance matrices are used in statistics to analyze relationships between variables, calculate variances, and assess how variables co-vary. The values in a covariance matrix describe the direction and strength of linear relationships between variables. A positive covariance indicates a positive linear relationship, while a negative covariance suggests a negative linear relationship. Covariance matrices are typically symmetric because the covariance between variables X and Y is the same as the covariance between Y and X. However, they are not orthonormal because their entries are not limited to values of 1, 0, or -1, which are characteristic of orthonormal matrices. To be orthonomal, a matrix must be both orthogonal (in that two vectors are perpendicular to one another and dot product is zero) and normal (the vector has a unit length of 1 whole unit). To calculate a covariance matrix, you compute the covariance between each pair of variables in your dataset. The covariance between two variables X and Y is computed as the average of the product of their deviations from their respective means:

1. $Cov(X, Y) = \Sigma [(X - \mu X) * (Y - \mu Y)] / (n - 1)$
2. Here, μX and μY are the means of X and Y, and n is the number of data points.

iii. **Eigenvalue decomposition:** PCA proceeds by performing an eigenvalue decomposition of the covariance matrix. This decomposition identifies the eigenvalues and eigenvectors of the covariance matrix. The eigenvalues represent the amount of variance explained by each principal component, while the eigenvectors correspond to the direction or linear combination of the original variables that define the principal components.

iv. **Selecting principal components:** The principal components are sorted in descending order of their associated eigenvalues. This means that the first principal component explains the most variance, the second explains the second most, and so on. Typically, you can choose a subset of the principal components that capture a sufficiently high percentage of the total variance in the data, reducing dimensionality.

v. **Data transformation:** The original data can be projected onto the selected principal components, creating a new dataset with reduced dimensionality. This transformed dataset retains the most important patterns and variance while reducing noise or redundant information.

8. **Multi-criteria decision analysis (MCDA):** Are scenarios where decisions are influenced by multiple criteria, often conflicting, and deciders must weigh (Read: value, objectives alignment) the import[ance] of each criterion in choosing an alternative over the other alternatives. Here, decision matrices are used to compare alternatives based on multiple criteria. Matrix operations, such as weighted sum or matrix multiplication, are used to calculate scores and rankings.
9. **Social constructed preference (a.k.a., social preference, individual selective agreement, social choice):** These are scenarios where multiple individuals or stakeholders take a collective and simultaneous decision (i.e., take a decision together) based upon individual selective agreement, often through a voting mechanisms or preference aggregation survey, with a pre-constructured set of possible solutions as votable, or preferences as available, for selection by the individuals.
   A. **Unity** - a specific number of people who are required to participate for the decision to be resolved. How many users must agree to a

specific choice, for the selection to be taken? How many individuals of the total population of individuals must vote for the a specific solution for the solution to be selected? How many individual users must agree to a specific choice, for the selection to be taken?

B. **Quorum** - a specific number or proportion of individuals required to be present or participate in an activity or decision process to make the decision "valid". How many individuals of the total population of individuals must vote for the vote to be counted/valid? Did enough people participate for the decision to be taken/ executed?

1.2 A decision support system

A.k.a., Decision support systems (dss), expert system, and executive information systems, executive support system (ess), machine learning systems, automation systems, information coordination system.

Decision support systems can be designed and applied for every scenario in the real-world to optimize solution selection toward optimal human fulfillment and optimal ecological restoration. A decision support system supports human decisioning regardless of the scenario. Whenever there is a decision, there is a problem/issue. A problem/issue is identified and data is collected with the basic purpose of solving the problem/decision. Data is evaluated in the context of a problem-solution to determine all possible ways to resolve the problem-solution. Identify and/or generate alternative solutions with the data available. The alternatives are evaluated to identify the most suitable/appropriate solution(s), by some critical method. Every alternative is compared with every other alternative so that the evaluation is accurate and gives more clarity toward the decision. The best alternative amongst the available alternatives is selected. The best selected alternative is implemented. The results of the implementation are fed back into the decision space, which then adapts appropriately. Follow-up reviews occur continuously and/or at every stage. I there a need for a modification to the selected solution; is the solution still required; has the issue changed? A decision system is, in part, a data solution resolution evaluation system.

A decision support system functions, in an automated manner, to meet the decision requirements of the population (in concern to habitat design, construction, operation, and material cycling). The decision support system designs and decides the master plans of habitats, and becomes operationalized at the level of a community habitat network (where resources and contribution are shared) as a whole. The decision support system combines calculation with human-ecological research, socio-technical engineering, and human [need and preference] requirements input. The results of decisions are modifications to the master plans to which the habitat team personnel, as technicians, provide services to the local populations. Decisioning is an integrated and systematic process in community that transparently completes a inquiry resolution protocol, the solution to which includes a set of value-alignment problem-solutions, and statistical calculation. The protocol (including: human involvement, value processes, and calculation) produces a new master plan to the habitat, and simultaneously, the whole habitat network. By societal engineering in this contributorily planned and projected way, it is possible to optimize human community values of freedom (openness), justice (fairness), and efficiency (of duty and of inclusivity). In effect, part of the goal is to engineering and facilitating the development of integrated and resilient habitat that power and feed the fulfillment needs of a community of families around the world. Using AI to optimize and coordinate, and sometimes, to act (as in, robotification).

A decision support system is an information system application that assists decisioning, from minor assistant e to possible full automation of decision. The informational and material elements of a decision support system include:

1. **Hardware** - materials composed to function as part of an information system.
2. **Database** - collection of current or past data.
3. **Model base** - logic and organizing rules; selection of analytical and mathematical models that can be made accessible to the decision system.
   A. **Physical model** - model of machine.
   B. **Mathematical model** - equation, formula.
   C. **Verbal model** - description of a procedure for doing work.
4. **Software (computer programs)** - applied computational language for use as interfaceable and functional application. Computer programs are applied through a programming language; computer programs are also known as software.
5. **Compiler (interpreter)** - translates programming language statements into machine language.

In this sense, it could be said that a decision system processes data to convert it into information (intelligence, etc.). A decision support system processes information to support the decisioning process of a control or coordinating element. Decision support systems may help a decisioning entity use data, documents, knowledge, and/or models to successfully complete decision process tasks. A decision system must necessarily have the ability to "execute" function/order/ etc., at the decision [time] event and to change to the structure/behavior of the next version of the system(s) operation.

Executive functioning is a kind of intelligence, a kind of ability to work out a way of solving a problem and then persisting and controlling "yourself" to actually and intelligently solve>decide the problem in the way that "you" worked out [a solution] to solve it. This is how "you" create solutions. Studies find that children who have more opportunity for self-directed play are better at "executive" functioning tasks than children with less opportunity to play. Similar studies show that children with more play are better able to control their emotions in emotion provoking situations. Essentially, what all the studies show is that hose children who have more opportunity for real play perform better on all of these kinds of assessments than children who don't have such opportunities. (Gray, 2023)

The purpose of a collaborative support system is to give people the tools to design information and material flows together. The purpose of a decision support system is to give people the tools to select the optimal informational and material compositions give all prior and probable input. A decision support system is a structured approach to decisions, which may be structured, semi-structured, or un-structured.

Project coordination (management system information) is the integration of the information sets of people, technology, procedures, resources, and time...for mutually beneficial work, for collaboration. This integration data is useful, but not sufficient in solving societal issue/problems. There is information system coordination and material system coordination (logistics). An information system is a planned system of collecting, storing, processing, and disseminating/ sharing data in the form of information. A material system is a planned system of collecting, storing, processing, and disseminating information in the form of material surfaces. Informational and material systems carry out the functions of society. A coordination information system is a group of information coordination methods tied to the automation, or support, of human decisioning. Note: In the market-State, management is getting things done through or with the people in the organization. In community, coordination is most appropriate (in place of management), because it does not carry with it the idea of extrinsic motivation. Whereas, collaborators coordinate because everyone is intrinsically motivated, managers “incentivize” with extrinsic motivation (i.e., with rewards punishment; coercion).

The basic functions performed by a coordinator are:

1. Planning decisions, tasks, and information and material flows.
2. Controlling and information flows
3. Staffing tasks
4. Organizing information and material flows.
5. Directing information and material flows

Coordination decision models include:

1. Optimization models - provide guidance for action by generating optimal solutions consistent with a series of constraints.
2. Forecasting models - provide guidance on resource supply, service demand, and probable action.

A system is a set of elements joined together to achieve a common objective; such as the joining together of all elements that form society to meet our mutual need for global access to well-being and all that humanity and the biosphere have to offer. Every system is composed of subsystems. In this model of society there are four core societal sub systems, the publications, and then the conceptual model itself into which those specifications fit in a spiral, and highly varied, manner. Systems have inputs that are processed through a transformation process that converts these inputs to outputs. The outputs of a useful societal system are beneficial services, service objects, and conditions, as specified by needs, objectives, and requirements.

Information systems may communicate information [via channels] transparently, or not. In the market-State, transparent information systems are called open source systems, named so because their code, construction and operation are open to inspection, understanding, and duplicable use.

Information generated by an information system may be for planning and control of operations, and other problem solving. Information system coordination involves processing in support of a wide range of possible organizational functions and operational processes. Information system coordination is capable of providing analysis, planning, and decision support.

A sufficiently information system must have at least the following subsystems, including not limited to,

1. Sensory, storage, and computation/processing systems.
2. Query systems.
3. Analysis systems.
4. Modeling systems.
5. Decision support systems.

Note that knowledge-based systems use knowledge about a specific application areas to facilitate decisioning.

> **INSIGHT:** *Decisions involve the nearly ubiquitous system’s process of: input > process > output.*

1.3 A decision space

> *A.k.a., A problem space, deciding, an issue space, a solution space, a options selection space, an action space, possibilities space.*

A "decision space" opens when a decision question is asked or a problem is presented, and it enables the resolution to a decision question. A decision space includes available choices, some of which are optimal choices and others of which are poor choices [for any given purpose]. Most decisions in social, economic, and engineering environments involve some form of a conceptual or technical problem. A decision space may also be called an 'action space' if the decision must resolve into action (or non-action). An action is something that influences an environment. A basic decision space consists of a set of *decision variables* that have a relationship with a set of *decision alternatives* being evaluated in a *decision process (or through a decision mechanism)*.

The term 'decision space' includes the word "space", which implies the existence of objects and events in an active and interrelated area where something occurs. A decision space is a place where events occur to objects and information maintains a flow [until the space is resolved]. With this consideration in mind, there are several commonly used definitions for a decision space that are semantically inaccurate. For example, the term 'decision space' is sometimes referred to as "the range or list of available alternatives". Since these "alternatives" are simply objects and do not represent activity or events they cannot by themselves be a decision space. Instead, they are information in a decision space, and are not the decision space itself. The only context in which this truncated definition for the term decision space makes rational sense is when someone is "making a choice" between potential outputs without the actual act of processing any inputs. As was noted earlier, this often happens when personal bias, opinion, or emotion, "make the choice".

Further, it is semantically imprecise if not inaccurate to use terms like "input decision space" and "output decision space". Neither input nor output represent a process; instead, they represent a one-way flow of information -- they represent objects excluding events. The same logic also renders inaccurate the definition of a decision space as "the inputs and outputs of a decision". Again, these elements are information in a decision space, but are not the decision space itself.

Decision spaces exist in the context of other decision spaces. The typical metaphor used to explain this is that of a stream. There are a stream of decisions surrounding any given decision; many earlier decisions have led up to this decision and made it both possible and limited. Many other decisions will follow from any given decision. Another way to describe this situation is to say that most decisions involve selecting from a group of previously known alternatives, made available from the universe of alternatives by the previous decisions. Previous decisions have "activated" or "made operable" certain alternatives and "deactivated" or "made inoperable" others. It might be said, then, that every decision space: (1) follows from previous decisions, (2) enables many future decisions, and (3) prevents other future decisions. When computers arrive at decisions within the context of other decisions the process is known as 'stream computing'. Data stream computing enables real-time analysis (or liquid analytics) of incoming information.

The very idea that a decision space exists in the context of other decision spaces leads to the inclusion of the idea of probability. In a decision space probabilistic information entropy models (i.e., patterned fractals) may be used to represent the uncertainty associated with the relevant information elements needed to resolve the decision. Understanding change is more than a linear projection, it appears as a probability patterned continuum. When a decision is taken and resolution of the decision space leads to an action, then the action will modify future probabilities [that will either help us all grow and develop, or not grow and create suffering, based on our decisions].

Some possibilities are more probable because of the decisions that have come before and the information already in the decision. In other words, past decision spaces affect the probability of future decision spaces. The future isn't set in stone; it is probable and it depends on the choices we make as individuals in society. The designs and concepts that we choose do in fact matter.

The decision space of a living organism represents its latitude to exercise free will. Therein, the information in a decision space reflects the awareness level and pattern recognition ability of the deciding entity.

When life is viewed as patterns of resonance then a spectrum of more capable relationships appears, all of which connect on a larger scale that allows for shared community/communities (of mind). A truly civilized kind of identity, although it poses new challenges. A more complex universe is within you, so you must learn to accord within a more complex universe. Evolution is in every term of the equation; it's always part of our makeup.

As individuals and society grow [in awareness and knowledge and consciousness] and lower their entropy, their decision space (by consequences) becomes larger, and therein, they can see the world from a wider perspective (i.e., one of greater integration and unification). When someone perceives the world from a wider perspective there is more of a realization that any given problem can be approached from many different angles. And possibly therein, individuals may come to see that that which was thought a/the problem is not actually a/the problem, or is just a symptom of a larger root problem. Herein, humanity may come to realize that its level of freedom depends highly on its level of awareness (or consciousness). The more conscious individuals are of themselves and their environment, the more information (i.e., data, and knowledge) they have available to their awareness to develop an optimally structured decision space. Some societies restrict awareness artificially in order to subjectively influence and control the decision space of their members. There are environmental conditions that influence our ability to make "good decisions". Herein, the notion of "personal responsibility" becomes significantly more complex when the environment is accounted for. Fundamentally, there are real limits that everyone faces when it comes to making "good" decisions in a complex and dynamic environment.

NOTE: *Decisions (as solution selection tasks) are resolved via methods and means, data and analysis, sampling and searching.*

1.3.1 Decision space elements

A decision space is composed of multiple interrelated elements. The three most general components of a decision space are inputs, processes, and outputs. Herein, a decision space is a coherent environment for integrating input, process, and output via the nearly ubiquitous systems methodology. Essentially, a decision space allows for decisioning (i.e., arriving at decisions) in an explicitly defined and systematic manner. The output is the selection of a decision, the process is the structure used to organize the inputs and arrive at a decision, and the input is the collection of information to be used in the process of deciding.

In a decision space, a **decision variable** is a variable under the direct input control of the deciding entity applied toward the evaluation of the decision alternatives. For example, if the decision involved the purchase of a car, then some of the relevant variables of this decision might include purchase price and budget, gas mileage, driven terrain, comfort, environmental considerations and other variables relevant to purchase of an automobile. Decision variables include: (1) the attributes (and to a lesser extent objectives) used for evaluating the alternatives; and (2) the decision mechanism used in the evaluation, analysis or algorithmic process. There also exists a set of uncontrollable variables known as external constraints.

The generic usage of the term **criterion** denotes the concepts of “attribute” and “objective”. In the decision space, a criteria is the clarified meaning of a decisions objective(s) and the characteristics (or attributes, attributed requirements) that each alternative must possess to a greater or lesser extent. The set of criteria in a decision should reflect all concerns relevant to the decision question or problem, and include measures for satisfying the objectives of the deciding entity. Such measures are called **attributes (or metrics)**, which are derived from the decision’s objectives. Please note that some people use the words attribute and criterion synonymously and other people use the word attribute to refer to a measurable criterion [as is the case herein].

A **decision objective** is a variable detailing the decisions intended resulting effects. Ultimate objectives (or ‘terminal objectives’) are usually framed in terms of their value orientation, such as economic sustainability, resource usage efficiency, and social cooperation. These are the high-level resulting effects desired from a decisions output. In a community the objective criteria are the community’s orientational and operational values. The concept of an objective is made functionally operational in the decision space by assigning to each objective under consideration one or more **attributes** that, directly or indirectly, measure the level of an objective's achievement in the consequential probability space.

The relationship between objectives and attributes has a hierarchical structure. At the highest level are the most general objectives (root objectives, goals, purpose(s), and values). They may then be defined in terms of more specific objectives, which themselves can be further defined at still lower levels. At the lowest level of the derivative hierarchy are attributes, which function as quantifiable indicators of the extent to which associated objectives are realized within a space generated by a decision question. Attributes and objectives are both decision variables and decision criteria. Criteria have at least five desirable properties: unambiguous; comprehensive; direct; operational; and understandable. (Keeny, 2004) Regardless of the complexity of the decision, criteria may be formulated and arranged into a priority hierarchy. Also, a criterion may implicitly or explicitly imply a constraint.

Constraints are limitations imposed by the discoverable boundaries of nature or by human beings that may preclude the selection of certain alternatives in the probability space. They represent restrictive conditions and real limitations. There are various kinds of constraints, including but not limited physical constraints (e.g., the availability of resources), value and moral constraints, logical constraints, scientific and technical, and cost constraints. **External constraints** (or environmental constraints) are uncontrollable inputs (vs. criteria, which are generally considered controllable). Constraints can be used to eliminate from consideration alternatives that are characterized by certain attributes. A “constraint map” displays the set of feasible alternatives (versus the universe of known alternatives).

Decision alternatives (options) are the list of available decision options at the disposal of the deciding entity, the “feasible set”. Each alternative represents a different final decision, a different arrangement of information. For example, a clothing designer may have to decide whether to use the colors blue or green or both, which would represent a finite feasible set of three decision alternatives. Alternatives can be identified by searching for them as well as developed (created where they did not previously exist). Normally, constraints exist restricting the feasible set of alternatives to a subset of alternatives. When building a material system the constraints may originate from resource restriction, carrying capacity, and functional usage. Essentially, the application of constraints to the decision space yields an implicit definition of the feasible set of alternatives; even though the individual alternatives may not be explicitly known upon the creation of the decision spaces. From a theoretical point-of-view, there is no major difference between an explicit or implicit definition of the feasible set. However, in the latter case there is the additional problem of identifying feasible alternatives.

The **decision mechanism (decision method)** refers to the process by which the decision is resolved and an alternative selected. The decision mechanism explains *how* a decision is to be arrived at. It details the specific decision process (technique or tool) that analyses all relevant information and resolves the decision space. The decision mechanism process is frequently known as a "decision analysis". During analysis, decision rules and decision procedures are followed until a final decision is reached.

Decision analysis is a systematic approach to deciding that involves the examining and modelling of sequences or pathways of diagnosing an issue, resolving a decision, and solving a problem. A decision analysis may be expressed graphically in the form of a decision model or decision tree. Generally, decision mechanisms identify relationships between input values, and then examine those relationships in a progressively resolving context that creates an increasingly cohesive set of information, which eventually reaches a functionally useful threshold that triggers the resolution of the decision space by a selection of one of the alternatives. In other words, the purpose of a decision analysis is to select one of two or more feasible alternatives through some form of analytic tool, of which there exist a variety of options. Analytical decision support tools include, but are not limited to: decision trees; influence diagrams; algorithms (decision algorithms); statistical tests; multi-criteria decision analysis; the analytical hierarchy process; optimization analytics (directs best possible outcome); cost-benefit analysis; naturalistic decision analysis (e.g., Bayesian models); and various other analytic tools. All analytical tools provide systematic and structured guidance; however, more advanced analytic techniques may be distinguished from traditional analytic techniques by the fact that they require a supporting data management system, which to a great extent has changed the decision analysis landscape of many organizational institutions.

This economic decision system may be described (in part) as a formalized 'decision analysis' system. Ronald Howard (2015) developed the functional idea of 'decision analysis', and it is an analytical mechanism that allows for the development of as rational a decision as possible by putting all of information about a topic into a formalized calculation system. Decision analysis involves systematic reasoning about the total known system, including the fulfillment of all individuals. In a community-type society, the Real World Community Model unifies all societal information, and therein, the decision system is the formalized and explicit computational resolver of all decisions.

Influence diagrams are a conceptual modelling tool that graphically represents the causal relationships between decisions, external factors, uncertainties and outcomes. Influence diagrams are useful for modelling and visually representing the 'problem space' (or 'decision problem'). Decision tress and influence diagrams are complementary visualization tools for modelling a decision problem.

A **decision tree** is a diagrammatic representation of the possible outcomes and events used in the decision analysis. It is also a way to display an algorithm. A decision diagram is composed of nodes and branches, creating an arborization effect. The steps proceed sequentially with each step depending on the decision arrived at in the preceding step. Decision trees are produced by algorithms that identify various ways of splitting a data set into branch-like segments. These segments form an inverted decision tree that originates with a root node at the top of the tree. The information object of analysis (i.e., problem question) is reflected in this root node as a simple, one-dimensional display in the decision tree interface.

A decision tree is a useful tool for the mapping of branching decisions and providing a framework for solving a problem. Whereas decision trees display the set of alternative values and variables for each decision as branches coming out of each node; the influence diagram shows the dependencies among the variables more clearly than the decision tree. The decision tree shows more details of possible paths or scenarios as sequences of branches.

A decision tree is one way to display an algorithm. An **algorithm** is a set of steps or rules (a protocol) that is followed to solve a decision or derive understanding. It involves a series of decisions, where input data is arranged or rearranged to lead to an outcome (or final decision selection). Although algorithms function best in decision situations where all elements of the solution are present, they may also be used under circumstances of uncertainty. A **decision algorithm** is a type of algorithm that answers a decision problem with either a yes or no. Such problems are central to computer science and ubiquitous to the socioeconomic and natural sciences worlds.

The process of modelling and solving a problem question with two or more non-commensurable and conflicting criterion is known in the literature as **multi-criteria decision analysis** (MCA). Criterion are non-commensurable if their level of attainment, with respect to given attributes cannot be measured in common units. Criterion are conflicting if an increase in the level of on criteria can only be achieved by decreasing the attainment of another. Usually, a conflict arises when the attainment of each criteria in a decision requires the shared use of limited available resources.

> **INSIGHT:** *Models, metaphors, and premises can only be stretched, with the information available, so far, before entering into logical inconsistencies and contradictions. Therein, it is wise to perceive a contradiction or inconsistency as a knowledge gap that might be inquired more deeply into.*

There is also the idea of **decision safety** -- as in, a safety net/layer to prevent someone from taking an action that may unknowingly cause harm. For instance, in important socio-technical programmable systems there is the potential for danger; such as when mixing chemicals, there is the potential for horrible undesired toxic chemicals to be produced that would damage people and objects. The idea of decision safety is to put barriers in place to ensure actions cannot be taken/ executed that would produced a set of certainly (100%) undersirable states. For instance, decision safety might start with warning after warning after even-more-dire warning will appear as user actions (byte sequences) typed into the programmable system bring them closer to a known undesired effect (e.g., toxic chemical release with a chemical production machine). Herein, it is possible to introduce a "safety layer" that would prevent those byte sequences from ever reaching the machine hardware, just in case; for instance, when a bug is introduced into the upper application layer of the code. Runtime checks are added to the safety layer to check its presence before byte execution. Herein, changes to the code have to be carefully reviewed before being checked in, including going through a checklist of items relating to the safety layer remaining in place and operational. The checklist includes a full set of unit tests that must pass in a test-bed environment before checking the code back in. The unit test cases included one for each of the potentially dangerous sequences. And, a standard [safe] operating procedure set for the user.

1.3.2 Decision optimization

We as individuals and as a community desire to arrive at optimal decisions given what we know and the circumstances of any situation, which is also a part of what we know. We have various inputs and various goals, which are transparent so that we may optimize our decision space. And herein, there arises a variety of strategies for arriving at decisions that lead toward our goals. A 'strategy' is essentially a conceptual tool. When conceptual tools actual begin to modify common systems in the habitat they are known as 'protocols' – protocols are an interface between our sensation of structure and the digital / material models of structure. In other words, our strategies become part of our protocols and our protocols routinely transform our environment as well as us. This is just basic decisioning – we arrive at decisions and our decisions have consequential feedback that affects us.

Strategies are encoded into the decisioning system through 'protocols' and 'standards'. Protocols automate the flow (or "directing control") of information which become services and productive goods in the habitat. Protocols have strategic and localized properties as well as temporal and spatial ones. Protocols are distributed across the community, which generates the potential for efficiency in designing (safety, modularity, auditing) the transport of resources. A protocol is a standardized method for controlling the flow of information using a boundary [condition] and a conceptual/mathematically patterned direction [encoded from a conceptual strategy].

> **INSIGHT:** *What are 'resources' if into packets of packets of information which are representational in different forms (e.g., sign, signifier, signified).*

Some protocols encode or re-encode conceptually formative structures into materially rendered existence; others only transform information at a digital or conceptual level. The application and network protocols behind a 3D printer are a useful example of a set of material information transformation protocols. Not only can a material rendering technology (i.e., a 3D printer) render out our conceptual ideas, but the technology itself, as a platform, is designed on another set of engineering principles that represent our emergently practical, sort of, "paradigmatic" technical understanding of the world. These are the principles we use to build things so that they function in the [f]actual world. And it is because they are not just a "social construction", but they actually function in the world [through our directed-intention], that there is a "technical" decision space where we can "run" technical protocols [that we have designed for our common fulfillment].

What is optimality as a function of an iterating time scenario? In an iterating time environment there is probability in each future iteration. In such a scenario there must also exist a spectrum of measure [while we are out of total synchronization (i.e., out of "no-time")]. This spectrum of probability (experienced as certainty and uncertainty) provides for our experience as consciousness and it is a structure for learning how to self-initiate the re-orientation of our thoughts and actions, and ultimately, coordinate our relationships.

What does a decision space do for consciousness if not provide an 'opportunity' (or "possibility"). 'Opportunity', by definition, represents a space for self-development. To remain stable, a community must maintain an environment where everyone can share in the opportunity to verify the totality of our common existence. This allows for self-verification and it facilitates the iterative redesign of a social habitat toward greater fulfillment - the opportune selection of a decision that structures greater fulfillment. This is true social integrity – to facilitate intrinsic, verifiable, and self-efficaciously learning experiences for every individual. It is from an understanding of a synthesized understanding of a system that trust in an "agreement protocol" in the system becomes possible. Herein, we state, "I don't know", until "I" know through experience and logically clarified communication. It is true integrity [in aligning decisions with a fulfilling direction] to take an interest in how things actually work without throwing anchors of belief out [as acts of fear in separation] as we learn more. We can create strategies that facilitate us in our overcoming of our own fears. We have a creative potential in all of spectral existence in which to design newly oriented technical systems when the present ones are no longer optimal.

To optimize decisioning, it is useful to simplify decisioning to its highest-level series of steps:

1. Have issue?
   A. Problem?

2. Gather information about issue.
   A. Gathering.
3. Generate alternative solutions to imagine resolving the issue(s).
   A. Generating (integrated syntheses; solution inquiry).
4. Evaluate alternative solutions to resolve those issues so that the best can be selected.
   A. Evaluating (analysis of solutions; parallel value inquiry).
5. Presenting and agreeing to a single alternative solution.
   A. Decision system protocol for coordinating master plans of habitats.
6. Executing upon to the decision by taking action in the real-world.
   A. Operating habitats and societal information services.

1.4 Change acceptance

NOTE: *Adaptive change must involve the identification of patterns, such as: demand patterns; patterns of renewal and regeneration; ecological patterns, patterns of waste; patterns of efficiency; patterns of functional effectiveness; patterns of fulfillment; and patterns of fairness.*

The idea that "change" is necessary for a "higher expression [of potential]" sounds rather mundane, but its implications are incredibly far reaching, and they effect all of us to a person. It has to do with our assumptions about change. Deep down most of us don't really recognize that profound change, radical change, extraordinary change, is actually possible. Whenever one thinks about trying to change something or reach for a higher possibility most of us tend to assume things are much more fixed, much more static, much more unchanging than they actually are. During the vast eons of our evolution things changed so slowly that in one person's lifetime it seemed like nothing was changing at all. There was very little change visible, other than a person aging. Essentially humans are deeply wired to look at the world around us and the world within us and see it as something that is standing still, that is not moving.

Carter Fips (2012) has published a work entitled "Evolutionaries" in which he explores the emergent evolutionary world view. In this book he named the very thing which is being discussed above. In the book, Fips calls it, "the spell of solidity". His point is that even though many people believe in evolution in some way, there is a deeper more persistent belief that the world they live in is static, is unchanging and that humans are solid or static too - "we hold beliefs, attachments". So even in the early 21st century, when technology is changing at such a rapid rate, many people still tend to assume that things are much more unchanging than they are. For instance, on a societal level when one looks out at the many problems facing humanity one may tend to see these problems as intractable, unfixable. Or on a cultural level when one looks at human greed, violence and other aberrant behaviors one may see they all seem so deeply rooted in our human nature that it would be so very difficult for anything to ever change. Its human nature after all, or so "they" say. And similarly, on an individual level, when someone takes up efforts to try and change their own consciousness and their own behavior, one frequently assumes that one's own nature and interrelationships are much more permanent and unchanging than they actually are. So this assumption of limitation is something most, if not all, humans experience.

Life is evolving in a universal cosmos, and that includes you and me. The cosmos is evolution in motion, and so are we. What this means in practice is that we need to constantly question the appearance of solidity, of stasis and to realize that things are not as solid as they seem; or are they? When you look around and see something that is stuck or immovable, you need to take a step back to a larger frame, even maybe a larger time frame. By "stepping backward" we are more likely to see that it hasn't always been this way and it won't always be this way, whatever it is, it is going to change.

We are in a process of 'emergence', of evolution, and of unfolding. Anything you can say about yourself, about the kind of person you are or what defines you, isn't really a statement about how you are in any static or solid sense, it is just a statement about how you are now. You are fluidity, a process of unfolding fulfillment; you are not a static unchanging thing. That can be a little disconcerting to the part of ourselves that images us to be a static and unchanging being, but if you can stay with it a bit you can start to feel the thrill of being in motion, *being in the flow*.

It is only when we begin to open to this reality of unending change, the dynamic of a process that we are, that we can make room for dramatic transformation and our highest human potentials.

1.5 Decisioning and voting

A.k.a., Arriving versus making/taking decisions, protocols versus opinions as decisions.

The two phrases, "arriving at decisions" and "making decisions", are often used synonymously, and both phrases indicate that something is being decided, and possibly, planned -- that something is to be intentionally changed in the real world. The verb phrase "arrive at" [a decision] indicates the existence of a process (Read: plan and plan execution) leading to a decision. Speaking metaphorically, all decisions include a journey (as in, process and plan) prior to their destination (decision), and the usage of the verb "arrive" maintains this meaning. There are many viable travel metaphors when it comes to the discussion of decisions. The verb, "to arrive" connotes some form of travel and the reaching of a destination, which has required forethought and planning. Its use signifies that something more substantial than just a thought, opinion, emotion or belief was used when deciding.

> **CLARIFICATION:** *The verb "to make" could also simply mean decisioning about planning, if the result is something that is intentionally designed. There is also the ideas of: 1) to make a mess, which requires no planning; and 2) to make a decision based on subjective opinion (i.e., without a common objective plan).*

Unlike the phrase, “to arrive at a decision”, the term “decision-making” (in its general usage in the 21st century) does not appear to convey the idea that a process led to a decision. If someone “makes” a decision based upon their own narrow (or limited) opinion of things, then the word “make” is likely appropriate. However, if a decision involved even the faintest of analyses, of calculations, of weighing and of reasoning, or of protocol, then it could also be said that the decision is being made; because, of all the technology that went into actually making the decision it. The phrases “transparent decision-making” and “decision-making process” include concepts that more clearly suggest the involvement of a process prior to the arrival of a decision.

Even the smallest of decisions by the human organism includes a process; for the process of deciding is one of the 37 fundamental cognitive processes modelled in the layered reference model of the brain (LRMB) (Wang, 2006). Thus, even if a decision was “made” based upon a single persons narrow opinion of things without any additional conscious analysis or weighing, their brain still went through some form of neural process to nevertheless “arrive” at the decision. Therefore, the difference in the usage of the terms “arrive at” and “make” in the context of deciding appears largely to speak to the degree of awareness the decider(s) has in how s/he actually came to a decision. Along this line of thinking, “decision-making” would primarily be considered an unconscious process and “arriving at a decision” a more conscious one - where the decider maintains an awareness of that which transpired during the decision process and is able to rationally explain why they selected a particular alternative.

There are a multiplicity of methods by which more than one decider may “make” a subjective decision. Voting is one of those methods. Voting involves the appearance of a process of some form prior to a final decision. However, voting is actually more of a “decision-making event” rather than a process of “arriving at a decision”, for voting is a win or lose tally model in which one alternative is “won” by numbers as opposed to concern for the issue itself. Therefore, voting stands in contrast to algorithms and other decision methods that involve input and processes leading to the arrival at a final decision. In the case of voting, the process of voting is itself the final decision; even though there may have been a process of arriving at options and understandings prior to the vote. In its application, voting often appears as a contest where the majority wins the decision as opposed to the community arriving at a final decision via a reasoned and logical process of information collection, verification and processing. But then, some decisions do not have a single best outcome, as is the case with many decisions of preference (i.e., preference choice). Mob rule is having 51% of a group overrule 49%. Does that make the 51% “socially correct”? Does it mean anything to be “socially correct”? What does it mean to be technically correct? Science transcends subjective feelings at a social level through visualization and falsifiable evidence, not just through the inter-subjective counting of heads (i.e., voting).

> **CLARIFICATION:** *Consensus voting is generally when everyone agrees and/or no one significantly objects.*

Majority voting is a representation of a system that values one dominant group over another, the majority over the minority. This is otherwise known as the “tyranny of the majority”. Also, when a group of people agree that majority rules, such as in “issue voting”, then it could be said that it is the circumstances of the situation that “make” the decision for the group. The identifiable composition of the group creates the final decision (notice the subjectivity and objectivity; subjective group preference and objective group identity). For example, when two political parties are vying for a single political office, then the voting public with the greatest representation in the vote will “make” one of the political parties the likely winner. There are a wide-variety of other situations where environmental circumstances can “make the decision”, such as when only two options are available and one of the options becomes unavailable. For example, a hiker mapped out two alternative trails prior to the hiking trip and upon arrival at the trail where the alternatives diverge, one of the trails is closed due to maintenance and safety.

Fundamentally, within any organization or group of people decisions have to be made and someone or something has to make them or, preferably, arrive at them [transparently]. The subtle distinction between the terms “make” and “arrive at” becomes increasingly important the more interrelated individuals become. The usage of an “arrive at” approach leads to the adoption of a formalized, transparent, and emergent decision process.

As long as people think in terms of “who are we going to vote for”, then they are looking in the wrong direction and do not understand either the scope or the source of the problem. In early 21st century society, decisioning is highly about access to the “decision maker” or “decision leader” of the day (i.e., access to politicians and executive businessmen). In contrast, in a community-type society, decisioning significantly involves transparent modeling of the overall information space and an objective decisioning process.

INSIGHT: *The market-State has two markets, the commercial market and the political market (the market for power-over-others). In the commercial and political market, votes are cast with currency.*

1.6 Decisioning in society

Every society is composed of four primary systems: a social system, a decision system, a material system, and a lifestyle system. Coming from a market-State mentality, one might then wonder where the "economic" and "governance" systems of society are positioned within such a structure. Both economics and governance concern decisions. Governance concerns decisions about the fundamental socio-technical organization of a system inclusive of peoples lives. Economics is decisions about the acquisition and transformation of resources into needed goods and services. It is essential to understand that both economics and governance are fundamentally decision-centric systems, and both types of decisions require intelligence, planning and documentation:

1. **Governance [planning] decision documents and procedures** (socio-technical behavioral relations).
    A. Agreements and violation consequences (legal system).
2. **Economic [planning] decision documents and procedures** (socio-technical production relations).
    B. Habitat master-plan productions (global habitat societal information service system expressed through locally customized habitat service systems (a.k.a., cities).

A more complete representation of the decision-centric construction of society is:

1. **In the market-State:**
    A. **State construction legal contracts and documents.**
        1. Constitution.
        2. Legislation.
        3. Case precedentation (precedent).
    B. **Business construction legal contracts documents.**
        1. Articles of incorporation.
    C. **Family construction legal contracts documents.**
        1. Wills.
        2. Power of attorney.
2. **In community:**
    A. **Global community construction agreements and documents** (Read: the societal specification standard).
    B. **Habitat community construction agreements and documents** (Read: local master operations plan, habitat service agreements, and personal habitat profile agreement).
    C. **Personal family construction agreements.**

NOTE: *All decisions require intelligence, and hence, a decision system that encompasses societal governance and economic planning could come to be called the, "Social Intelligence Service".*

In practice, decisioning occurs throughout all axiomatic systems in any given society:

1. **Social system.**
    A. Needs.
        1. Human needs and preferences list (and ecological services list).
    B. Values.
        1. Community core values list (and stabilizing objectives list).
    C. Knowledge and methodology.
        1. Knowledge database, and educated methodology list.
2. **Decision system.**
    A. Deciding global and local agreements (i.e. global and local governance).
        1. Global citizen deciding.
        2. Local citizen deciding.
        3. InterSystem service contributing citizen deciding.
    B. Deciding economy (i.e., global and local habitat service system makeup).
        1. Resident deciding (user demands for common and personal access).
        2. Contribution deciding (InterSystem team operations).
        3. Local customized master-plan deciding working groups.
            i. Current local habitat resource allocation.
            ii. Future local habitat resource allocation.
3. **Material system.**
    A. Physical object assemblies and real-world socio-technical configurations.
    B. Production and distribution networks.
    C. Physical human contribution.
    D. Physical human end-user.
4. **Lifestyle system.**
    A. Life-phase access to habitat services (lifestyle).
    B. Service access fulfillment evaluation.
    C. Flow evaluation.
    D. Well-being and quality-of-life evaluation.

To compare the market-State to community in this context, the following is derived:

1. **Social system:**

A. **Demand:**
   1. **The market-State demand:** Wants and affordabilities.
   2. **Community demand:** Needs (and preferences).
      i. Human needs list (and ecological services list).

B. **Orientation (values):**
   1. **The market-State provides value:** Profits and purchaseabilities.
   2. **Community provides value:** Life-phase user human need through core values list (and stabilizing objectives list).

C. **Knowledge and methodology (approach).**
   1. **The market-State approach:** Schooling and employment.
   2. **Community approach:** Common heritage knowledge, tutoring, and contribution.

2. **Decision system.**
   A. **The market-State approach:** State legal documents, business legal documents, family legal documents, and technical guiding documents.
   B. **Community approach:** Personal agreement profile, commons coordination, local master-plan decision work groups, societal standards and decisioning work groups.
3. **Material system.**
   A. **The market-State configuration:** Private contracted property, inclusive of objects and intelligences (people and AI) who own and are owned as "objects".
   B. **Community configuration:** Objects arranged by contributors into physically interfaceable service systems to meet the needs of the global population.
4. **Lifestyle system.**
   A. **The market-State lifestyle:** Seeing everyone as a consumer, from birth and nurturing, through school, into poverty or employment, and then to retirement, all governed by anyone's token (monetary) net worth.
   B. **Community approach:** Free access to societal services throughout all life phases, where fulfillment is optimized: nurturing, education, contribution, leisure.

After clarifying the primary systems, it is essential to identify how access is integrated:

1. **Economic decisioning:**
   A. **In market-State:** Market mechanisms (competitive property planning; many overlapping project plans).
   B. **In community:** Community mechanisms (cooperative and coordinated commons planning; a globally oriented plan allowing for flexibility in the cyclical customizability of local habitats).
2. **Governance and administrative decisioning:**
   A. **In market-State:** Governance decisioning based on some mix of citizen direct voting, citizen-to-politician representative voting through to military dictatorial decisioning, under market-State conditions. In the State, there is legal representation (either in court, in referendum, or in political figurehead). In the market, there are legal business (all of which are property owned by one or more entities). Here, the State manages the citizens, and business mange the final productions for citizens lives. In the State, the governance documents are the constitution, legislation, and legal cases. In the market, the governance documents are the articles of formation of the business (a.k.a., articles of information, articles of trust, etc.).
   B. **In community:** Governance is more accurately called, "coordination", and is coordinated through a complex involving contribution, education, and residentation (in habitats). Here, contributors are users in a temporary phase of life, and users access societal services in a highly coordinated, cooperative and team-oriented manner. In community, the societal specification standard, is the "governance" document. Hence, in community, "governance" documents are more accurately called, the "community societal specification standard". A community standard is an integrated and unified, evidence-based societal standard representation of knowledge that informs and re-forms, reproduces and adapts the socio-technical structure of the society as community.

2 Decision modeling

A.k.a., A decision event model.

Herein, decision making refers to the directing of attention to the consequences, needs, values, data, and other factorial variables. Yet, decisioning does not just involve perceptions, but it requires analytical overlay and the systematic arrival at a decision. In truth, by the time someone comes to the end of a frameworked decisioning process the decision is very often self-evident - it frameworks the design itself. With sufficient information decisions can be somewhat rhetorically said to “design themselves”. When laying things out clearly, like way-points and obstructions on a roadmap, the decision is often self-evident. The nature of the problem suggests its solution. By resonating into a larger and more universal context a problem can be seen more clearly and solved with greater grace.

A ‘decision model’ is a visual representation of the structured logic framework, involving processes and activities, that are followed to arrive at a decision (i.e., it is a model of the decision mechanism). It models logic and is based on the inherent structure of that logic, eliminating style and other subjective preferences, ensuring a consistent and stable representation. A decision model (or mechanism) is simply a tool that allows for a thorough analysis (and sometimes synthesis) of available decision inputs and alternatives. In general, a model is a simplified representation or abstraction of reality, and many “real world models” - models that are intended to reflect the way in which the world actually works - may be significantly accurate or inaccurate in their alignment with objective reality. Decision models are used to visualize a decision space and modelling is essential to any transparent and collaborative decision.

There exist a number of decision models, including but not limited to rational, recognition, and naturalistic, or some combination thereof. In the Community the contextual environment in which the decision arises determines the selection of a decision model. When time is available, the most accurately available, rational decision model is applied toward the selection the most reasonable (best or optimal) course of action based upon the information available at the time. When an emergency (or urgent situation) with a higher degree of uncertainty is identified, then a more naturalistic decision model is applied.

A decision model must adapt to new information when it becomes available, otherwise the model is likely to become an increasingly inaccurate representation of the real world, and clearly, less rational. The ability to adapt to new information when it becomes available is commonly known as ‘strategic adaptation’. If an entity does not adapt its decision process as it receives new information, then its decisions are likely to become increasingly unpredictable and potentially less aligned with its desired outcomes. Imagine for a moment an archer who for several seconds before releasing an arrow toward a target, fails to account for the abrupt change in wind speed and direction. The final resting place of the arrow becomes unpredictable as soon as the archer stops accounting for incoming sense data about the wind. Also, as an archer is learning archery s/he will be introduced to new information that will cause him or her to revise and update the decision model being used to accurately hit the centre of the target. The archer might first be introduced to the concept of wind and then later the concept of rain -- additional concepts modify the archer’s decision model so that it more accurately reflects the consequential realities of archery in the material world.

Real world decision problems are characterized by the following conditions:

1. A list of all possible alternatives (the actions/ decisions).
2. A list of possible future states (the outcomes; states of nature, of a system).
   A. A "state of nature" is an outcome over which the decision taker has little or no control.
3. Impact associated with each alternative/state (of nature) combination.
4. An assessment of the degree of certainty of possible future events.
5. A decision criterion (rules, a ruleset, requirements, etc.).

Decision problems can be formed into tables (decision matrices), for example:

Matrix Z		State of Nature (j)		
	$a_i \setminus s_j$	s_1	s_2	s_3
Alternative (i)	a_1	Z_{11}	Z_{12}	Z_{13}
	a_2	Z_{21}	Z_{22}	Z_{23}
	a_3	Z_{31}	Z_{32}	Z_{33}

- Wherein,
  - a_i - i^{th} alternative.
  - s_j - the j^{th} state of nature (event).
  - V_{ij} - the impact that will be realized if the alternative i is chosen and event j occurs.
  - $Z_{11}...Z_{33}$ - the matrix coefficients

2.1 Visualization

A.k.a., Visual modeling.

Visualization provides a visual model that everyone across an organization can point to in order to identify objects and relationships, and thus, facilitate decision alignment (between individuals). Visualization of data is essential for decisioning in community in order to ensure a shared understanding to determine a shared resolution. Making a structure visible (as well as traceable); it is possible to immediately see which parts are important and how they interconnect. Through visualization and standardization a proof-of-concept may be developed and tested. All systems can be visualized, and ought to be visualized prior to integration into a common life-support, habitat service, system. Community modeling can solve many of the world's current problems. For example, resource coordination will resolve most resource shortages when demand is filtered through human need prioritization, rather than market privatization. It is possible to visualize object and information flows. Therein, technology is not a panacea. However, it can be extremely useful in solving many kinds of problems. Fundamentally, it is important to visualize the model (Read: the system) so the users know what it is doing, how it influences, and what it is likely to create.

> **INSIGHT:** *It is possible to visualize and model common human fulfillment ("collective welfare").*

Decision visualization objectives in a community environment include, but are not limited to:

1. Cognition objective: The objective is to model the construction of the functional system as a conceptual specification by investigating the potential of all alternatives. The result is:
    1. Documentation objective: The objective is to describe and explain the possibilities and constructability of the solution specification.
        i. Textual objective: The objective is to define terms and compose a linguistic system with functional significance.
            1. Kernel specification (core textual standard).
            2. Handbooks (manuals and education materials).
        ii. Illustration/drawing/visualization objective: The objective is to demonstrate the possibilities, feasibilities, uses, and consequences (if,then and cause-effect) of the solution specification.
            1. Concept models (conceptual model).
            2. Drawing models (physical model).
            3. Animation models (physical and/or conceptual model in 3D and over time).
            4. Simulation models (physical model in 3D, over time, and with variable parameters).
2. Construction objective:
    A. The objective is to assemble the construction to specification (using all the available documentation)
3. Operations objective:
    A. The objective is to operate the construction to specification (using all available documentation).

2.2 Rational decision modeling

> **QUESTION:** *How might a society "delegate" the process of deciding to one of rational thought and logical calculation using verifiable information toward everyone's fulfillment?*

Rational decision models must at least involve a cognitive process (i.e., a decision mechanism) where each step follows in a logical order and the model is designed to rationally develop and identify a desired resolution to the decision space. Herein, the term cognitive refers to thinking through, processing and assessing, inputs and alternatives in a larger information context to arrive at a decision. As the word rational suggests, this approach means that there must exist a non-contradictory rationale for the selection of a decision. Any approach that uses non-contradictory identification and logical relationships must also use visualization tools, such as charts, flow charts, diagrams, modelling, and systems and concept mapping. (Novak, 2008) The utilization of a rational decision model ensures that consistency and efficacy exist as conceptual attributes of the decision process. Rational decision models can be visualized, and thus, more clearly communicated. And, clear communication is a necessity for transparency in a community.

Take note here that in the rational scientific method, modeling always involves objects (in relationship to one another). In this sense, all rational decisioning must account for objects. In the case of decisioning, objects are referred to, generally, as resources. Resources, like objects, can be pointed to, are "objective" (i.e., they are objects, as that with shape, that can be pointed to).

Other decision models are more subjective, and therefore, less consistent, structured, shareable and transparent. A rational decision model supports consideration of the full range of factors relating to a decision, in a logical and comprehensive manner. It presupposes that it is possible to consider every available option if given sufficient time as well as access to all relevant information.

Further, a rational decision model presumes that there is at least one best outcome, or result most aligned with a set of criteria. Because of this it is sometimes called an 'optimizing decision model' or 'holistic decision model'.

However, it is not true to state that rational models presuppose to know the future consequences of every option. Impact studies may be completed and probable consequences may be reasoned and calculated, but to state that rational models presuppose knowing every future consequence is incorrect and negates the idea inherent in the model that there must exist an identifiable and non-contradictory relationship between all objects and events in the decision space. All decision models have their limits. A rational decision model is limited by the availability of information and time, and the robustness and accuracy of the applied methods.

The predictability of a rational decision model is at least partially determined by the accuracy of the available information. Objective scientific inquiry is one means of arriving at accurate information.

2.3 Societal decision information modeling

Decision information modeling may be used to optimize the organization and coordination of a population of individuals, by accounting for and integrating the following operational elements (including, but not limited to):

1. Social-data conceptualizations (user-developer side).
2. Service-access calculations (developer side).
3. Resource-production mechanizations (developer side).
4. Scheduling-contribution executions (developer side).
5. Scheduling-product access (user side).

Herein, there are the categories of:

1. **Resource-allocation identification.** Here, the design is inclusive of resource availability.
2. **Production calculation (resource allocation calculation).** Here, the design is inclusive of resource position optimization via linear algebraic equations.
3. **Production protocol (engineering design inquiry selection).** Here, the design is inclusive of engineering optimization via a parallel inquiry process (that produces a solution to an issue as the deliverable).
4. **Service demand identification (inclusive of counting demand and identifying preference).** Here, the design is inclusive of counting and measurement.
5. **Contribution scheduling (time scheduling work).** Here, the design is inclusive of contribution effort and availability.
6. **Habitat access (resource occupation scheduling for users).** Here, the design is inclusive of access met through demand for need fulfillment, and preference therein.

At a fundamental processing level, a socio-technical fulfillment system may have decisions present at all of the following levels:

1. **Identification** (inquiries, issues *over time*).
2. **Calculation** (mathematics, computation *over time*).
3. **Resolution** (engineering, plan-design *over time*).
4. **Operation** (laboring, production *over time*).
5. **Usage** (demand, access *over time*).

2.4 Decision tables

A decision table represents the conditions in relationship to action/outputs. A decision table is a [visual, objective] framework for describing a set of related decision rules. The decision table is the structure for defining the rules between conditions and actions. Decision tables allow for a functional visual layout of decisioning information. A decision table is a precise way to model complicated logic in the context of decisioning. Decision tables are a way to model the "if, then, else" conceptual construction of action interrelationship (i.e., cause and effect). Generally, a decision table displays what actions are to be taken when certain conditions are met. Here, conditions must be related to actions (or, non-actions), where the table is filled in with all possible interrelationships.

Decision tables (flow charts, trees, and other diagrams) may be used to represent decisions. A decision table documents (complicated) logic. Decision tables allow for the organization of information such that testing all combinations of the possible conditions becomes possible. Decision tables are used derive a value that has one of a few possible outcomes, where each outcome can be detected by a test condition. A decision table lists two or more rows, each containing test conditions, optional actions, and a result.

A decision table is a test technique that visually presents combinations of inputs and outputs, where inputs are conditions (or cases), and outputs are actions (or effects). A full decision table contains all combinations of conditions and actions. A test is simply execution of an operation on the table, either testing the logic within the table itself, or adding additional logic (formula) and running (computing) the test.

A test is a question that can be answered using the data in the table and some logic (which mus be capable of being validly applied to the table). An inquiry could be viewed as a test. In fact, each of the inquiry processes in the decision system are test run on available data to ensure solutions are as expect by society.

Tables can be used to test and to derive tests. Tests can be run on tables to identify faults in the system under test and interrelationships between data. Each test will verify that certain object conditions (condition values) lead to certain expected actions or results (e.g.,as in a decision system).

All computer programs use logic (i.e., have a mechanism for expressing logic). Decision tables allow for the precise and visual representation of logic. Tables are so useful and intuitive at representing complex, logical information that they are sometimes called self-document forms of information.

A decision table associates conditions with actions to perform. A decision table contains two initial data inputs:

1. The conditions - an "if" statement.
2. The actions - a "do" statement.

A limited entry decision table is composed of:

1. Conditions - a condition is a logical statement that may have only one of two values -- true or false.
2. Actions - an action is an operation.
3. Rules - a rule is a statement that describes a set of conditions in order that a specific action can be performed. Here, a rule statement is an "if", then "do" statement (i.e., "if" condition is present, then "do" action). Fundamentally, the decision table is a structure for defining a set of rules.

However, every completed decision table has four primary parts:

1. **The condition [stub*]** - lists the individual inputs upon which the decision depends. The conditions stub (the conditions) is equivalent to a test or question, and in some computer simulations, the if section of the if, then, else logic.
2. **The action [stub*]** - lists the alternative actions that may be taken (the actions that could be taken depending on the conditions) . These are the procedures or operations are to be performed depending on the conditions.
3. **The entry [parts]** - show the conditions under which each action is selected.
   A. **Entry part for conditions.**
   B. **Entry part for action.**
4. **The rules -** each rule gives a test case.

** "Stub" stands for (is short for) structured programming.*

Wherein, all conditions relate to actions, and all actions relate to conditions. Actions and conditions are related via the logic of rules (or requirements). Afterward, evaluations of actions ensure future actions relate more closely to expected conditions, by updating the ruleset.

There are several categories decision table, which the extent of the conditions present:

1. Limited-entry decision tables - Decision tables in which all of the conditions are binary. Limited-entry decision table with *n* conditions has 2^n distinct rules.
2. Extended-entry decision tables - Decision tables in which all of the conditions have a finite number of alternative values.
3. Mixed-entry decision tables - Decision tables in which some of the conditions have a finite number of alternative values and others are strictly binary.

2.5 Decisioning perspectives

A decision space may be experienced from several perspectives. From a *psychosomatic perspective* it is necessary to examine decisions in the context of a set of individual and collective needs, beliefs, emotions, preferences and values. Alternatively, a *cognitive perspective* involves an examination of the environment in which a decision question is posed. This perspective is based on three fundamental concepts: *knowledge*, *understanding*, and *preference*. From a socio-economic *normative perspective*, the analysis of decisions is concerned with the logic of the decision process, its rationality, and its invariant consequences. Yet, at another level, a decision process is simply a logical *problem solving* activity which is terminated when an optimal, aligned, and sufficiently resolved information set is reached. Decisions may also be approached from a *holistic perspective*, which involves the collection of and attention to all relevant information. And, when information is unavailable the holistic approach inquires into the knowledge gap.

Additional notes on decisions include:

1. Studies indicate that differences (i.e., diversities) in perception, attitudes, values and beliefs can lead to different approaches to the decision process, and therefore, different decision spaces and different final decisions.
2. An ideology is a conceptual framework through which people pre-process reality and it represents a ‘bias’ in a decision process.
3. The process by which decisions are logically arrived at is an important part of all science-based professions, where empirical knowledge in a given area is used to derive informed decisions. Empirical refers to that which is observed or experienced; capable of being verified or disproved by observation or experiment.

2.6 Decisioning and societal stability

A stable social environment is necessarily an environment that accounts for the *restoration* of the individual, such that stress and ‘decision fatigue’ do not exist at a continuously sufficient threshold to cause a reduction in optimum human decision making capacity. When decision fatigue (a.k.a., ego-fatigue and willpower fatigue) and other fatiguing stressors set-in, then individuals naturally become less likely to make value-based and fulfillment-oriented decisions in personal, social, and economic contexts. And, they are more likely to turn their decisions over to someone else to make. Effortful choice is bio-physiologically costly, and humans [individualistically] have a energy resource requirement for quality decisioning. The amount of willpower that we have to apply to effort is limited. Willpower is a finite and daily regenerative resource affected by [at least] belief and nutrition intake. When decision fatigue sets in it doesn’t differentiate between big decisions and small decisions. Basically, each individual has a "budget" of daily decisions, which can be modified a little by when and how one eats, and how one thinks about themselves. (Vohs, 2005)

As decision fatigue sets in it is associated with increasingly poorer decisions - more and more indecision, fatigue, and stress, and less and less of an ability to make rational and clear decisions [as the day progresses]. Experiments show that individuals have a qualified, finite store of mental energy for exerting self-control toward decisioning. Generally, with every decision it becomes harder for our brain to continue to make decisions. The result is that by the end of a "long day", when someone is low on mental energy, that person is going to be more likely to give in to impulse (i.e., to have their self-directed freedom reduced). Also, it is interesting to note that planning [contextually] reduces the likelihood of decision fatigue because the decisions are already made (i.e., they are already planned for).

Fundamentally, our health, though particularly the healthy functioning of our neurophysiology, affects our ability to arrive at optimal decisions toward our fulfillment. Neurological damage and malfunctioning can impair our decisioning capabilities.

2.7 Who makes decisions in a community-type society?

The very question, "Who makes decisions?" is devoid of logic. It is not who makes decisions, it is by what method are decisions arrived at? The question of who makes decisions is a biased attribute that we have concocted because of our irrationally found fear of each other and groups which continue to jockey for power based on the rewards/incentives of the current system that is used as a tool for control. This blueprint describes the decisioning system in detail.

> **NOTE:** *In order to exist in a state of sustainability (with the planet) and equitability (among humanity), the allocation and distribution of common heritage resources via goods and services (i.e., the economy) ought not be influenced by personal biases or hazardous reward vested interest.*

In community, tasked actions are carried out through revolving and voluntary interdisciplinary systems teams, which assist in aspects of society that basically cannot yet be automated. The goal is to increase objective and value oriented decisioning as much as possible, and when we understand that our problems in life are technical, the merit of this approach is without parallel.

In order to arrive at an optimal final decision, coherence (alignment) of InterSystem Team contributors is necessary, which requires at least the following:

1. Precise language (technical terms).
2. Units of measurement.
3. References (sources of data).
4. Concept models (concept of operation).
5. Technical drawings and diagrams (drawing specifications).
6. Technical written documentation (written specifications).
7. Explanations and reasoning (reasoning specifications).
8. Simulation.
9. Statistical data analysis (statistical table calculation).
10. Algebraic data analysis (algebraic table calculation).
11. Humans agreeing (or disagreeing), alignment threshold decisions.

2.8 How money influences decisioning

The following is the abstract from an journal article by Kouchaki et al. (2013) entitled "*Seeing green: mere exposure to money triggers a business decision frame and unethical outcomes*", which demonstrates how money can negatively impact decisioning.

> *"Can mere exposure to money corrupt? In four studies, we examined the likelihood of unethical outcomes when the construct of money was activated through the use of priming techniques. The results of Study 1 demonstrated that individuals primed with money were more likely to demonstrate unethical intentions than those in the control group. In Study 2, we showed that participants primed with money were more likely to adopt a business decision frame. In Studies 3 and 4, we found that money cues triggered a business decision frame, which led to a greater likelihood of unethical intentions and behavior. Together, the results of these studies demonstrate that mere exposure to money can trigger unethical intentions and behavior and that decision frame mediates this effect."*

The findings show that "even if we are well intentioned, even if we think we know right from wrong, there may be factors influencing our decisions and behaviors that we're not aware of". The scientific effect seen here is more broadly known as 'priming' (values priming, behavior priming, and so forth).

3 An economic decision system

A.k.a., An economic decision event system, a socio-economic decision system, a socio-technical decision fulfillment system, a societal resource decision system, a societal access decision system, etc.

An [economic] decision system represents a set of logical relationships between processes applied to resolve issues that have opened a decision space in the real world community and may lead to the modification of the material state of the habitat. Once a decision is taken/approved, it must be executed and implemented per timetable. Decisions influence materiality, and that which humans most care about when it comes to their material fulfillment, they care about the economy. All decisions at a societal layer influence everyone's individual level of material fulfillment (and of socio-economic access opportunity). This decision system describes and explains the process by which decisions about the material environment are resolved together among humanity. "We" have options at the socio-economic level as to how "we" organize our means of access to the resources and the necessities of life.

These processes are systematically structured and represent the formally agreed upon design method by which the community arrives at economic and other decisions that impact the community's habitat. Herein, economic decisions are those decisions that concern the allocation of common heritage resources toward the design, access, and re-integrating of services and technical products to meet a set of identifiable needs using all available information. The system represents the technical encoding and re-encoding of our social information system into our habitat for a common and purposefully oriented "next iteration" of the total habitat system toward a structure of greater potential fulfillment.

The decision system is composed of systematic decisioning processes designed to address the economic movement of common resources in the fulfillment of all human needs, while sustainably optimizing and iterating designs for higher human fulfillment and ecological consideration. Therein, it is a rule set for energy exchange and transformation that defines a system for human fulfillment that accounts for a common real world information set.

The societal decision system herein is neither static nor established, but exists in a dynamic interplay with its environment, the real-world community information system. Once a community is organized around a similar information system, then individuals might begin to arrive at similar social understandings and commonly formalized economic decisions. In order to accurately orient economic decisions toward an intentional direction, decision systems must keep track of the underlying environmental conditions as well as the micro / macro changes to the coordinating system itself. If the underlying conditions used to make decisions change, then the decision itself is no longer as correct as at the time it was made. And, when the underlying conditions that inform a decision change the decisions [design] space must change.

The decision system may also be referred to as a decision[ing] model. Actions that impact the state of the various systems of the Habitat are arrived at within the bounds of this commonly developed and informed decisioning [modelled] space. It is a model that exists to support the community in taking commonly fulfilling action in the real world - "it is a model of our mutuality in a mutually ecological world".

A stable community requires a transparent and person-independent method of arriving at decisions that impact the community and the accessible, safely sustainable restructuring and redistribution of commonly inherited resources. A socially cooperative and transparently formalized decisioning method (or model) allows for the potential existence of such a decisioning system. It is a model that reduces the incentive desire, and systematically generated likelihood, of anyone "making" biased or opinionated decisions about common heritage resources. Instead, economic decisions are arrived at through a common and systematic process of parallel inquiry (enquiry) via information gathering, ordering, and synthesizing into newly feasible designs.

The decision system is designed to meet the technical needs of the community (e.g., life, technology, and social) in a manner orientationally aligned through the community's value system. The decision system involves herein involves the "calculation of a solution". Calculation is defined herein simply as the absence of opinion or bias in its decision (since the source of the information is verified and transparent - an information trace exists). It is the process of linking a solution to an identifiable problem/issue based on certainly verifiable facts (Read: confidence statements), logical understandings, and synthesized solution responses, rather than opinions. Decisions made under a political philosophy, persuasive game or contest, stand in contrast to decisions arrived at via a process of calculation being applied as a tool for an intentionally known and fulfilling purpose. In a community with an emergent, formalized decisioning calculation process everyone has the opportunity to participate in the decision process by introducing new data, knowledge, and understandings into the real-world community information system from which the decisioning model acquires its inputs. Which, begs the question, who sets up the parameters for the system; who programs the system: we do, in parallel. In community, there are co-creators and design becomes co-construction (Read: ["con" = together with] + ["struction" = structure] = [with structure]). In other words, design at a social level is "socially constructed" from an information set common to the social group. Herein, "development" [of designs] occur through the organization of a lateral [collaboration] network.

If one person's ideas are empirically accurate and another persons are not, then the methods of science and critical integration select the accurate idea and not the one more people may "think" (or be lead to believe) is right. Accurate information can be verified to be so.

As highest creators in the trophic sphere on this planet we have the greatest control over the habitat; we can caretake our ecology or we can send its dynamic life-support systems into decline.

> **NOTE:** *It is very rare for family members to fight over the food on a table when they each know their needs and can see their resources. No sensible person would turn their family into a competitive market-based system. So, why would anyone consider perpetuating competitive-based decisioning among the human family?*

3.1 What is an economy?

> **INSIGHT:** *Humanity can transform material resources together, or we can transform them against one another.*

An economy is the structure, mechanisms and relations that guide the production, distribution, and usage of goods and services in a society. In application, an economy is the acquisition and transformation of resources into needed goods and services. In this way, in a community economy, the services in the habitat are the economic services of society. Habitat services are the services that meet human need for physical goods and services for life, technology, and exploratory support. The actual physical economy (an accountable planetary common heritage ecology) is defined by common heritage resources that become needed goods and services in habitats. In community, the only purpose of economic activity is to provide for the needs (and preferences) of the people in that society – whether those needs are consumed collectively (e.g., health and education) or individually (e.g., shoes and food). Economic coordination ought to be directed to the aim of achieving socio-technically determined goals, the most important of which are common and objective human needs (and preferences).

An economy is a system that involves needs for resources, informational and physical, and is related to the acquisition and transformation of material resources to cyclically complete needs. In community, an economy involves a process of user contribution and cooperative decisioning around common [heritage] resources -- many users contributing to informational and habitational services, which is coordinated via a contribution service system.

An economy is the combination of several factors:

1. **Planning (i.e., management, coordination)** - all economies are planned; it is in how they are planned that they differ in structure. Such as, market-capital planned, State-capital planned, mixed-Public-private capital planned, or community common heritage planned. Plans (strategic) are required to meet needs in standardized manner well into the future.
2. **Resources (i.e., objects and information)** - physical and informational resources. All economies are based on resources. Physical resources are all useful [3D] objects, and informational resources are all useful [data] concepts.
3. **Users (i.e., everyone)** - human users of community with real-world human needs and requirements for fulfillment and flourishing, within bio-spheric ecology with its own needs (requirements) to continue to provide ecological services to humans.
4. **Human contribution (i.e., people)** - team users who contribute time, knowledge and skill. In community, the economy is based on user-contributors; whereas, in the market-State, it is based on combination of employer, employee, consumer (three market identities), and citizens (State identity).
5. **Deliverable services and objects (i.e., work, production)** - identify and meet need fulfillment requirements through the production of objects, the interactions between objects (services), and human contribution (i.e., service-to-others).

At the very least, all economies are composed of:

1. **People (humans).**
   A. Users.
   B. Workers (InterSystem team members).
2. **Objects** (a.k.a., materials, resources, technologies).
   A. Intermediary, used by the InterSystem team to produce the societal informational and local habitats system.
   B. End-user (a.k.a., goods, products, service-objects, etc.), used by individuals living in a community network of habitats for personal and common access.
3. **Services** (a.k.a., actions, techniques, processes, productions).
   A. Contribution as a service.
   B. Planning as a service. (a.k.a., organized decisioning, coordinating contribution).
   C. Common and personal access as a service.

In any economy, there are decisions about resources and the motions of resources; wherein, (motion is measured based on observable quantities in native units):

1. Human motion (labor time).
   A. Time (for humans).

2. Motion of objects (mechanical causes and effects).
   A. Volume (for machines).
3. Electrical power (energy technology).
   A. Power (for machines).
4. Computational power (computing technology).
   A. Computers (for optimization).
5. Social motivation (duty, intelligence).
   A. Education (for motivation and contribution).

Through work, people and resources, an economy is born, and human flourishing has a potential. All economies are thus based on:

1. Work[ing] events:
   A. Contribution through effortful coordination (team).
   B. Contribution through completion of survey and feedback (user).
2. People (a.k.a., humans), who are:
   A. Team access contributors.
   B. Users accessors:
      1. Common access.
      2. Personal access.
3. Resources (a.k.a., objects, technologies, materials, etc.).

Economics can happen at two broadly categorized scales, which occur together in an integrated manner in community, and occur in a separated manner in the market-State:

1. **Micro-economics (individual-ized)** - individual user in community, or consumer and business, economic decisioning.
   A. In this decision system, micro-economics concerns each of the parallel decision inquiry sub-processes.
2. **Macro-economic (social-ized)** - global/planetary in community, and State, Union, nation, country economic decisioning.
   A. In this decision system, the macro-economy consists of global resource coordination, global demand assessment, global production and distribution protocols, and a global access system.

Economic [planning] decision elements include (socio-technical production relations).

1. Humans with economic demanding needs and preferences.
2. Fulfillment requirements.
   A. Current fulfillment operations/produces.
3. Resource requirements.
   A. Resource survey.
   B. Resource availability.
4. Contribution requirements (skilled labor-time).
   A. Contribution survey.
   B. Contribution availability.
5. Decision requirements.
   A. Global decision inquiry.
   B. Local decision inquiry.
6. Next solution design.
   A. Global community fulfillment
   B. Local habitat fulfillment.
7. Executable economic projects.

In practice, an economy is the acquisition and transformation of resources into needed goods and services through a single office and single factory (as one economic unit of production, together). All production, as tension along a rope, has a material change side and an information standard side. Effectively, all economies are composed of work in offices (standards) and work in factories (a.k.a., habitats). It could very generally be said that an economy is a single office and a single factory. In community, the global network of habitats could be viewed as the economy. In the market, an economy is where trade occurs, observed as barter or price. In the State, an economy is where the provisioning of finance and power-over-others ("authority" to use violence) is observed. Effectively, in the market-State, resources and labor are allocated based on profit considerations, rather than fulfilling human needs.

> **INSIGHT:** *Historically speaking, economies have been about: Who gets what (i.e., what people get what), and also who are considered people.*

An economy is sustained by acquiring resources and transforming them into needed habitat-service fulfillment products. The most important factor (besides shelter) being, food. An economy is the acquisition and transformation of resources into needed goods (and services), the basis being shelter and food. A societal decision systems relates master habitat design planning (habitat architectural master planning) to master habitat resource planning (economic statistical calculation).

Different societal system have different perspectives on what an economy is. Differing views on the conception of economics include, but may not be limited to:

1. **The monetary, competitive view -** economics is the problem of the [optimal] supply and demand of goods via the method of trade. The market economy is a competitive economic game for access to scare resources.
2. **The community, cooperative view -** economics is the problem of the [optimal] fulfillment of human requirements via the method of modeling. Community is an intelligent and collaboratively assembled societal operation.

In Greek, the word 'economy' means "the management of a household, with an emphasis on preserving one's environmental support system". A 'natural law economy' is an economy that bases decisions about resource transformations and human fulfillment on the most accurate information model of the "lawfully natural" reality presently known. By this definition there are some "economic systems" that are actually anti-economies, because they are not based on models of human need fulfillment and on the sustainability of the lifeground from which all material needs are by necessity, regeneratively fulfilled. The aim of a fulfillment-oriented economic model is to "economize", to be efficient and to conserve, and hence preserve ecological human fulfillment services. Herein, a responsive economic system responds to the coherent issuance of human needs in a fulfillment-oriented manner.

> **CLARIFICATION:** *An economy with a "market" means that the economy includes some amount of property exchange/trade. A market-economy is a sub-type of economic system. In a market-economy, there are three possible elements to trade: people (selves); objects (technologies); and information (data).*

The informational environment of an economic system is primarily encompassed by its decision system -- an economic system is a decision system at a higher level. An economy is a decision system that accounts for data about resources when resolving issues. An economy is the [efficient] transformation of resources (objects) into needed services and usable objects (products) through decisions. There are many ways of deciding the transformation of resources, some of which involve coercion, others involve trade, some involve contribution, and some involve transparent externalization of their algorithms.

Herein, economics refers to the decision space where human needs (demands) for resources (and their socio-technical configurations) are decided by, and for, individuals among a population. Simply, economics is concerned with the formation of a social decision space where choices are taken concerning the transformation of resources into needed goods and services. Economics refers to the coordination ("management") of resources. The question then arises, how do populations (people together) select the best choices for the transformation of resources into habitat services? More specifically, how does the population get the most fulfilling and optimal outcome from a situation?

An human [life] economy should be measured based upon human needs, resources, and the carry capacity of the environment. Therein, an economy can operate without a price mechanism in that the information required to make the economy work can be performed by computer simulation, extrapolation, and calculation so that the value and demand is represented within a software system. Simply, it is possible to develop a computational system to automate the analysis of human demand and environmental supply (e.g., economic computing).

The very purpose of an economy is the fulfillment of human material need. Therein, one of the functions of an economic system is to provide the capability to order and organize our fulfillment and our life[style] in a particular manner. The economy is the material foundation of social survival. Of note, the basic economy of the world is in fact photosynthesis, the stored sunlight of the world from which everything flows. In a very real sense, photosynthesis is the basic economy of the planet, not money.

An economic model is like any other model, it is a theoretical construct representing component processes as a set of variables or functions, and a description of the logical relationships between them and among a whole. An economy is the human and technological activity involved in the production, exchange, distribution, consumption, and regeneration/recycling of resources, goods and services, in an efficient manner on the basis of all available information, including human need and a known orientationally desirable value state. In other words, an economy is a material resource transformer. It is a formalized information framework for transforming resources in a common (i.e., community) manner. It transforms resources into more fulfilling and more complex resources, while accounting for their re-integration into the larger ecological system from which further information is gathered.

An economy is a formalized approach toward the allocative transformation of resources into the fulfillment of service needs. There are a multitude of reasons why societies have difficulty in formalizing an economic model. The two most prominent issues are (1) they don't get on the "same page", they do not have a common social organization and they have not identified a functionally useful methodology (e.g., the systems methodology); and (2) they maintain pre-existing (i.e., established) structures that conceal elements of the total societal system, hindering transparency (e.g., government agencies & business entities), which negate the potential for formalizing a set of emergent and common understandings [between fulfilled individuals]. In order to maintain systematic fulfillment of human needs at the community level the individuals within the community must maintain a systems-level approach to systems level issues. The systems approach isn't effectively applied to an established economic system; such behavior is known as "patchwork", which is not systematically enabling (of new intentional system states).

In an economic sense, the social domain holds information on the practices, research & discovery, work-group standard selection, and material expressions associated with the production, use, and management of [spatial] resources'. Economic components can be, for example some of the high-level categories of flow of some-thing are: individuals, information systems, spatial systems, InterSystem Teams, and algorithmic coordinators. Some ways of coordinating an environment are better at meeting human needs and generating human flourishing, than others.

A “true economy” continuously increases in its efficiency as a process of adapting to a dynamic, governing environment. This sort of economy values actions that are scientifically correct, and hence, provide a certain probability of accurately orienting. It necessitates strategic accounting, allocation, and design as derived from proven technical parameters that assure maximum efficiency and sustainability.

What is the difference between “true economics” versus an ideological economic philosophy built upon a series of pre-suppositions that have been given the illusion of permanence? A true economic system is emergently designed and iteratively developed upon transparent empirical findings from the natural world; for if a community behaves in ignorance of existence, then it cannot orient and will “suffer” the natural consequences of the governing system dynamic (i.e., technical existence). An ideology is an orientational philosophy built upon pre-supposed ideas that may or may not have any relation to the real, existent world -- it is the difference between a systems-based approach and an approach that applies the filter of an “-ism”.

The integrity of any society, of any socio-economic system, is best measured by how closely aligned its structure and functionality are to the governing regulations (laws and principles) of nature. We can biomimic functional ecological patterns more precisely with more accurate information. And, there are great benefits to this for higher potential expressive fulfillment of our community.

If a society behaves in a manner that negates nature, then it will suffer the technical consequences of nature, which cannot be anthropomorphized. If a society dumps a toxin in their water supply, then such a society will suffer the biological effects (and social ramifications) of that action. If a person consistently gets poor quality sleep, then their biological and psychological well-being will suffer.

The Decision System herein is not an “authority-based” model. It is simply an emergently agreed upon model, commonly developed and informed by a distributed, open community of sharing and cooperating users. New discovers improve the model and do not threaten “establishments” and “institutions”, as there are none. Established interests generally seek to limit the transition to systems that might interrupt their establishments (e.g., “market share”). An institution is established by long practice and often develops its own rules. Institutions put up walls to prevent empathy and clear thinking with others. In particular, established institutions maintain an authority-based structure. Transition attempts in a system of established interests (of hierarchical power) are often met with great resistance by the established interests themselves.

Every economy requires at least these two inputs: (1) *human activity* and (2) *technological activity.* And, in a monetary economy *financial activity* is the 3rd input. However, we are not discussing a monetary economy here -- this is a systems-based economy (*3rd activity* = a transparent system approach), and hence, it is dynamically accountable. In a stably oriented and “true economy”, an increase in technological efficiency should lead to new technological activities replacing banal human labour activities to free human individuals in the community to more greatly explore their own higher potential of fulfillment. In other words, new technological developments should lead to increases in automation and mechanization activity, services which have the potential to accomplish technical tasks with greater efficiency and to free humankind to develop itself and its capabilities toward higher potentials of existence.

In order for individuals to trust a decision to achieve a set outcome, there is a need for a plan and set of materials to increase certainty:

1. A plan for orienting people from dis-similar societal backgrounds to the operational state of the community-based societal system.
2. A set of materials for facilitating orientation tailored to unique societal backgrounds.

To have 100% trust in a system you must have 100% transparency of that system. Without needing to ask permission and without the belief in authority the real world is open for anyone to *inquire* into, *create* and innovate through, and to *share* mutually. A group of individuals with a shared social orientation toward real world fulfillment are likely to recognize that to act socially they need a model that comes as close to the empirical world as possible. They need a decision model whose outputs (i.e., habitat modifications) are capable of approximating desirable value conditions, those values that fulfill the community’s ultimate purpose and goals.

As humanity, we can no longer have erroneous and duplicitous socio-economic systems held in place by elite establishments. A true economic system serves the habitat (i.e., caretaking) and our community (i.e., a consciously interrelated service system), which relies on the habitat for its continued existence.

The economy is ultimately the result of [a set of] core decisions about personal direction and orientation, which might involve questions about the exercise of power and control, and the design of systems that generate states of fulfillment. Herein, some common questions might be: who produces what, for whom, under what structural conditions; who benefits and who doesn’t? What is the economic structure of our society and what paradigm of thought regenerates it? Economic power and social power are closely related, they are similarly encoded. And, in some countries they are so related they are almost impossible to tear apart.

Essentially, in order to understand a socio-economic system it must be examined as a whole [information] system. When discussing a society’s economic system, said discussion [absolutely] must contain a description of the organization of the social system, which encodes and re-encodes the economic system. If a social system does not encode an economic system with great forethought (i.e., with "universally preferential values"), then its economic structure is likely to maintain a persistent state of insufficient basic and social need fulfillment. An economic design description that does not contain a sufficient description of the social organization that foundations its design is quite unhelpful. To clarify the notion of "encoded", this refers to a system's structural attributes (e.g., values) such as needing, for example, "to compete" in order to succeed [in the market economy]. Encoding refers to structure that is built into the system's framework, or encoded and reinforces particular behaviors.

All human behaviors are part of a [human] network. There are downstream network consequences to all behaviors and decisions. In other words, there are network effects to behaviors (and decisions), which propagate throughout the human population [network] from a source (event) to a 2nd network entity, then 3rd, and so on.

Significant questions for the generation of an economy might include:

1. How can we live and flourish within the real limits that our planet gives us?
2. What is a necessary and sufficient condition for sustained fulfillment and ecological consideration?
3. If the rules of a socio-economic environment maintain a primal state of competition among persons in a society, then what are the biological, psychological, and sociological results of that?

A true economic decision system is simply a formally engineered system, into which we feed our demands for a comprehensive service feasibility evaluation, based upon factually informed protocols (e.g., efficiency and sustainability protocols).

3.1.1 "Linear" and "circular" economies

Simplistically speaking, a "linear" economy refers to an economic flow in which raw materials are used to make a product, and after use, it is wasted (i.e., disposed of in a landfill). Such waste may include, for example, the product itself and its packaging. In contrast, products in a "circular" economy are designed to be reused and recycled. In an economy based on materials cycling, materials are reused and decomposed.

3.1.2 Planning and economies

A.k.a., Planning and socio-economic, socio-technical systems.

Economic planning occurs in all configurations of society; however, different configurations of society conduct [socio-]economic planning differently:

1. **The highest-level category of plan:**
   A. **Macro-economic plan**: The breakdown of total production (i.e., the breakdown of total labour time) between various highly aggregated categories of end use.
      1. **A macro-economic plan for the market-State** - must answer the following: How much to the provision of social goods such as health, education or socialised child-care? How much to the accumulation of means of production to augment the future productive capacity of the economy? How much (if any) to the repayment of debt or the acquisition of assets? How intensively the economy's given productive capacity should be exploited? How much money supply? What are the corporations and States secret and public high-level economic plans?
      2. **A macro-economic plan for community** - involves the transparent prioritization of material state reconfigurations (i.e., modifications to the material environment) from a life-grounded base of needs, which become engineering requirements for configurations of common heritage resources. It must answer the following: What is the societal project? What is the standard for completion of the project? What material configuration is required (for humans to flourish)? When is "it" required? In what condition is "it" required? What resources are available? How will those accessible resources flow into an optimized material state-dynamic consisting of aggregated services and objects of end-use, prioritized by life need, and oriented through a value set? Where is the standard that informs how needs and preferences are met?
2. **Middle-level category of plan:**
   A. **Strategic plan:** The global information system within which there is a decision system that accounts for global common heritage resources and all human demands.
      1. **A strategic plan for the market-State** - concerns the changing industrial structure of the economy. Here, there are business plans and industrial plans. Given that so much of the available labour-time is to be devoted to public provision, so much to consumer goods, and so much to producer goods, which particular sectors should be developed, exploiting which technologies? Which types of goods should be imported, because they can be produced more cheaply elsewhere?

Which industries should be phased out over the long run? How much can be produced for how much profit? What are the corporations and States secret and public middle-level economic plans?

2. **A strategic plan for community** - concerns the service support structure of the material system. This is the information model for the global habitat service system structure (i.e., life, technical, facility, etc.). How much of each individual service or object must be produced? When must it be produced? How must it be produced? Who needs it? Where do they need it? What is the sustainability, freedom, justice, and efficiency of the plan? Where is the strategic plan to meet the needs of the whole population?

3. **Lowest-level category of plan:**

   A. **A detailed production plan**:

   1. **A detailed production plan for the market-**State - for the precise allocation of resources, by means of local business plans, local zoning plans, local city plans and laws. Which specific types of goods are to be produced in what quantities, using how much labour, and in which locations? Which productive units are to receive inputs from which others? What are the salaries? What are the profits? What are the corporations and States secret and public low-level economic plans?
   2. **A detailed production plan for community** - a locally customized habitat service system (city) engineering plan. The local habitat [support service system] master plans. What are the preferences? Where are the preferences? Who is having a preference? Is the plan a good fit for the residents of the local habitat? Where is the unified plan to meet the residents preferences?

The societal economic planning categories of a market-State system do not correlate precisely with those of a community-type societal system. The general notion of economic 'planning' in the market-State has no unified [life] orientation. The market-State is easily observed to prioritize market services at the expense of community, aesthetics, open spaces, etc. To those who believe in the market, the market becomes the priority. Community is an environment of trust and togetherness, and therefore, planning takes on a service-to-others orientation at the societal level. All socio-economic systems can be modeled. A community-based socio-economic system is based on open and transparent modeling. In the early 21st century, most of the models that visualize the operation of society are either (1) difficult to come by, because they are secret/proprietary to profitable organizations, or (2) they are absent entirely and have never been fully visualized.

3.2 A socio-economic system

A.k.a., A socio-technical system.

The term 'socio-economic' implies that there exists an inherent relationship between a society's social organization and its economic organization. Both social and economic relationships concern how we interrelate and to whom we relate. Herein, social interrelationships can organize, if effectively coordinated, the sufficient fulfillment of all known economic need through a commonly decisive, socio-economically frameworked systems approach.

> **NOTE:** *Whereas the Social System models social issues, the Decision System models material problems, which are also social problems.*

A community requires a way of thinking about society that is designed to actually meet human needs. A design that has the potential to provide every human being in the community with a shared high-quality of living, at any scale, while protecting the integrity of the environment (i.e., our home and habitat), and removing the basis for scarcity-driven sources of conflict (including war and poverty). A community necessitates a more systematic, critical and scientific approach to "economics", one whose reference is the real world, "natural law", and the Earth's resources, rather than the movements of money, and the exchange of products and gifts.

It cannot exactly be said of a true socio-economic system that within such a system "collective interests transcend the individual interest". If social and economic systems "transcend" (Read: eclipse or are superior to) the individual, then they cannot at the same time claim that they are designed to fulfill the needs of individual human beings. The statement, "transcend the individual," indicates the potential or even need for the establishment of a power hierarchy over the individual such that s/he remains in-line with the "transcendent" system. Such is the type of euphemistic claim an "authority" figure might make. In reality, social and economic systems do not "transcend" the individual interest, and the use of such language is not a correct way of describing a community's decisioning organization. The socio-economic systems of a community are an interest of each individual in the community, and they arises out of the individuals desire to have his or her needs fulfilled in a cooperatively organized manner. Systems cannot be said to "transcend" the individual when they are informed by individuals. Note that sometimes the concept "to transcend" is being used in place of the idea of "emergence"; in such a case it would be preferable to actually use the term, 'emergence'.

Economic decisions have individual, social, and ecological ramifications. And, economic decisions are the products of the encoding of social understandings.

> **NOTE:** *When corporations create [social] culture through their designs and the release of profit-oriented products, then the integration of commonality into community is unlikely to be present. It is fundamentally unwise to allow an economic system to modify its accompanying social system haphazardly, which is [in part] that which is occurring when market entities "create culture".*

3.2.1 A socio-economic network

A.k.a., A socio-technical network.

An economy is the comprehensive interaction of lots of individuals (or "actors") interacting among networks of interaction. A network is an interconnected system interacting for mutual assistance [the basic unit of which is a 'resource']. Out of all of those individual interactions emerges a set of patterns and behaviors. In other words, the economy is a complex and distributed system (in reality) which may have several dominant attributes causing it to express particular patterns and behaviors among its observed network. Through questioning we come to identify and clarify. To identify an economy's access structure one might first seek to uncover its incentive structure. Someone might ask: What is the 'economic value' (or "wealth") in the economy? Is it, what I have in my bank account?; Is it, what the GDP statistics say? What is the measure we might use when we think about wealth and the direction we orient ourselves toward the whole network of lots of individual interactions? Here, we take pause, to ask, "What are human needs?" What are the real solutions to human problems in a 'trophospheric ecology' and what are 'empty signifiers' of well-being?

> **QUESTIONS:** *Is "wealth" the accumulation of solutions to problems that involve our entire human society? Is growth, then, the rate at which those solutions are being created and made accessible?*

A wealthy society has solved lots of problems, while structuring an environment that fulfills our beings. Because these economic network systems are complex and adaptive, their natural inclination is to concentrate both advantages and disadvantages; they are multiplicative. The question of our fulfillment then becomes, "Is 'access' to resources being concentrated in the hands of the few, or is an abundance of access being used by us to explore our higher potentials." In every complex economic network there are self-reinforcing feedbacks throughout the system. Conversely, and for example, growing wealth concentration is inherent to capitalism (Piketty, 2015) and "poverty" is a consequence of its behavior.

What is progress; is it anything that pushes money around an economic system? The view of progress as monetary circulation leads to the stereotypical business ethic: If you can make money doing something you should make money doing something. The business of business is not to solve societies problems, which is dangerous to the continued circulation of money which maintains business.

The change in perspective offered by the view of a distributed network architecture can lead a much clearer conversation about priorities, structures, and decisions.

3.2.2 Socio-economic system planning

A.k.a., Socio-economic planning, socio-technical planning, economic planning, economic plan evaluation.

Planning is necessary for all socio-economic functions. There are three general types of possible economic planning in society:

1. **In-natura economy** - originally, an economy that uses barter. This type of economy has a market, but does not use money/tokens. Economic planning "in-natura" refers to an economic [planning] system where goods and services are directly exchanged or distributed based on their physical characteristics or quantities, rather than using a monetary system. In-natura planning is often associated traditional barter economies. Here, the planning does not involve products/ services being converted into a tokens. The goods are directly exchanged or provided in their physical form, without the involvement of money as a medium of exchange. Exchange within an "in-natura" system typically involves barter or non-monetary transactions, where goods or services are exchanged directly between parties based on the party's specific needs and available resources. The valuation and allocation of resources are primarily based on their inherent useful qualities. Here, there is the prototypical [primitive] market. In-natura systems, which involve direct exchange (non-monetary transactions), do not require extensive mathematical modeling in the same way as the two formalized economic systems. Instead, barter systems rely on practical considerations, negotiation, and the inherent value or usefulness of goods and services being exchanged (as well as the ability to manipulate the other parties in a trade in order to advantage the trade for oneself). While mathematical techniques might be used for specific calculations or assessments, the overall functioning of in-natura systems does not rely heavily on formal mathematical frameworks.
2. **In-natura economic planning (a.k.a., planning in-natura, innatural planning, economic calculation in-natura, quantity-based economic calculation planning)** - a formalized economy

based on natural units (i.e., natural quantity units), including labor hours. An in-natura economic plan is devised "in natura", meaning that it is devised in quantities of different objects and services that are to be produced and used in the production of other goods and services. In other words, an economic plan is devised "in natura" means that it is devised in quantities of different objects and services that are to be produced and used in the production of other goods and services. This type of economy may or may not use tokens (i.e., may or may not have a market, may or may not have price/exchange). Economic planning "in-natura" refers to a system of economic planning where goods and services are allocated or distributed based on their physical quantities (e.g. meters, m^3, watts, seconds, etc.) and the services themselves (e.g., life, technology, etc.), rather than through monetary (token/price) means. Calculation in-natura needs no commensurate units. It doesn't need money, labor time, or units of utility. Instead, the utility of a plan is assessed directly in what it does for humanity (i.e., in terms of the support services of life, technology, and exploratory). It requires a comprehensive inventory of resources. This type of planning focuses on meeting specific needs or fulfilling certain known criteria, rather than relying on monetary transactions. When common, objective human needs are accounted for, then planning must be done, at least in part, in physical terms (including, working hours/years, physical resources, and utilized services). Here, there are three in-natura units:

A. Natural physical quantity units (a.k.a., natural units).
   1. For example, grams, meters, meters cubed, seconds, etc.
B. Labor time as a unit (a.k.a., natural work units, socially necessary labor time units).
   1. For example, seconds, hours, etc.
C. Habitat human-need service units.
   1. Life (including: architecture, power, etc.).
   2. Technology (including: communications, transportation, etc.).
   3. Exploratory (including: education, technology development, etc.).

3. **In-kind economic planning (a.k.a., in kind planning, planning in-kind, planning in kind, in-kind calculation, in kind calculation, calculation in-kind, calculation in kind)** - a formalized economy based on "in-kind" calculations that take into account the quality, attributes, or characteristics of objects and services. This type of economy may or may not use tokens (i.e., may or may not have a market, may or may not have price/exchange). Economic planning "in-kind" refers to a system of economic planning where goods and services are allocated or distributed based on their specific characteristics or types (i.e., need/service categories), rather than through monetary means. It involves categorizing goods and services into different types or service classes, and ensuring a fair/appropriate distribution of these categories. Here, the goal is to match available resources to productions to fulfill specific needs or objectives. In-kind and in-natura planning involve providing specific quantities and types of service-objects to individuals (or habitats) based on their needs. A community-type society uses in-kind and in-natura economic planning based on human needs separated into life, technology, and exploratory support service categories (as well as other categories). Community produces and distributes human fulfillment based on needs, and not entitlements; because the later, entitlements, is likely to create or exacerbate class divisions in society. In community, all economic planning and engineering is based upon (at least) human needs, engineering calculations, and resource availability. In-kind systems often employ mathematical optimization techniques, such as linear programming, as pioneered by Leonid Kantorovich and Wassily Leontief. These techniques are used to allocate limited resources efficiently and facilitate the optimal distribution of goods and services via calculated plans. Kantorovich's work on optimal resource allocation and Leontief's input-output analysis provide mathematical models for planning production and consumption without explicitly incorporating money or prices. In-kind calculation is calculating in terms of use values (a.k.a., services) in order to coordinate the fulfillment of all human need. Here, there are services (e.g., life, technology, and exploratory), that meet human needs, and to which material resources are dedicated and become occupied within (a.k.a., service units, technical units, socio-technical units, production units, habitat units).
4. **Monetary economic planning (a.k.a., financial planning, business planning, money planning, cost planning)** - a formalized economy that uses currency/money (has a market, includes money). Economic planning "with money" refers to an economic [planning] system where exchange transactions are typically conducted using currency (money), and the value of goods and services is measured in monetary terms. This type of system relies on the use of money as a

medium of exchange, unit of account, and store of value. The pricing and allocation of resources are determined by market forces such as supply and demand. Here, there is a market for the exchange of goods and services for money, and there may even be financial markets for the exchange and growth of finances themselves. Here, all economic planning and engineering is based upon (at least) money availability. Monetary systems are typically associated with neoclassical economics, which utilizes mathematical models based on microeconomic and macroeconomic principles. These models often involve concepts like supply and demand, utility theory, production functions, and general equilibrium theory. Mathematical tools used in monetary systems include calculus, optimization theory, game theory, and statistical analysis. These models incorporate the role of money, prices, and markets in resource allocation, and the mathematics involved helps describe the relationships between various economic agents and variables. Monetary [market] systems are typically associated with neoclassical economics (a.k.a., bourgeois economics, bourgeois political economics, etc,), which utilizes mathematical models based on "micro-economic" and "macro-economic" market-based principles. These "mirco-" and "macro-" market models market-based definitions of the following primary economic concepts: market supply and market demand, market production functions, general equilibrium theory, and game theory. Fundamentally, by comparing money costs with money profits (and other benefits) one may arrive at a rational monetary-wealth maximizing course-of-action. In this configuration of society, only money provides a rational basis for comparing costs.

3.2.3 Basic economic accounting

In the context of developing a comprehensive taxonomy for understanding and constructing a community-type society, especially from an engineering and societal development perspective, including physical resources and basic economic accounting is essential. These elements play fundamental roles in the design effectiveness and operational efficiency of any society.

1. **Physical resources:** Physical resources are acquired by means of cultivation, mining, and materials sciences. Physical resources have the following attributes:
   A. **Acquisition:** The processes and strategies for obtaining physical resources, including land, materials, and energy sources. This involves negotiation, trade agreements, sustainable sourcing practices, and consideration of environmental impact and resource scarcity.
   B. **Quantity:** Assessing and planning for the amount of each resource needed to support the community's operations, growth, and sustainability goals. This includes forecasting future needs based on demographic trends and technological advancements.
   C. **Quality:** Ensuring that the resources acquired meet certain standards necessary for their intended use. Quality control measures, testing, certification, and monitoring are essential to maintain the integrity and safety of community operations and products. In application, materials (as elemental substances) have properties, and objects (as assemblies) have functions.
2. **Basic economic accounting:** Wherein, an economy is the planned acquisition and transformation of resources into needed goods and services (their cycling in the habitat and larger ecological biosphere). These basic units of account for an economy include:
   A. **Labor time accounting:** All organizations (partnerships) usually calculate with labour time internally, but switch to money at the boundary of the market. The internal measurement and valuation of work contributions in terms of time spent. This approach emphasizes the equitable distribution of work and rewards within the community, fostering a sense of fairness and collaboration.
      1. Labor time accounting software:
         i. Arbeitszeitapp [github.com/arbeitszeit/arbeitszeitapp] - an open-source planning interface for organizations, enabling a work-time management interface for organizations and workers.
            1. Tasks available to users of the software include:
               a. Plans can get filed and approved.
               b. Products can get published.
               c. Work and consumption can get registered.
            2. There are three user roles:
               a. Organizations can file plans for each product (or service) they offer. A plan describes a product and defines how much working time it will require ("cost").
               b. Members are workers in a production organization. They receive work tokens ("price certificates") for their

worked hours. They can use them to consume products and services priced in those tokens/certificates.

c. Accountants are delegates of the cooperating network of production units. They can approve production unit plans based on collectively agreed criteria.

B. **Monetary accounting (trade/transactions at market boundaries):** While labor time may serve as an internal metric, interactions with external entities (like markets) typically necessitate the use of money. This requires the community to establish exchange rates between labor time and monetary units, coordinate financial protocols and accounts ("wallets"), and engage in traditional economic transactions.

1. Traditional cash-currency financial software.
    i. GNUCash [gnucash.org]
2. Crypto-currency distributed ledger banking software.

C. **Resource budgeting and allocation:** The process of distributing available resources (both physical and financial) to meet the community's strategic and sustained needs and objectives. This involves prioritization, efficiency optimization, and contingency planning to ensure resilience and sustainability. This involves thresholds and the accounting of resources to strategically developed master solution plans. In this case, thresholds are "budgets", and going over threshold in a biosphere is a "cost". Here, resources are allocated to human requirements.

D. **Societal standards and practices:** Developing standards that integrate the long-term understanding and economic health of the society, such as investment in community-type habitat settlements (i.e., investment in a network of community-type habitats/cities).

E. **Societal Standards Development Platform:**

1. **Versioning software:**
    i. Github [github.com]: Utilized for collaborative development of societal standards, practices, and documentation, enabling communities to contribute to and evolve community-type habitat settlement guidelines.
2. **Engineering software** (a.k.a., collaborative design software):
    i. Text.
    ii. Vector.
    iii. 3D Object.
    iv. Simulation (i.e., moving 3D objects).
    v. Calculation.
3. **Human need accounting:**
    i. Assessing [of human need] software:
        1. Surveying software.
    ii. Mapping of survey data:
        1. OpenStreetMap (OSM) with Custom Layers [openstreetmap.org]: For geospatially mapping [community] resources, [human] needs, and [societal] services, OSM can be adapted with custom layers to visually represent and manage the distribution of resources and services according to human needs.

F. **Decision accounting:** All organizations visualize and plan to execute changes in order to adapt the environment to their visualization.

1. **Project coordination (project accounting) software.**
    i. Approval.
    ii. Coordination of project lists, inclusive of persons, roles, tasks, deliverables, schedules, risks, decisions, etc.
2. **Economic calculation software.**
    i. Economic plans for physical quantities of resources to be allocated to human need fulfillment within a habitat service system structure. Here, there are software for the development of economic plans for the allocation of physical quantities of resources to meet human needs within a habitat service system structure, including both in-natura and in-kind plans.
        1. In-natura plans - tables of allocations of resources to habitat services where all resources are measured in physical mass and material characteristics and all services are measured in human need completion/actualization.
        2. In-kind plans - conversion between
        3. Open source matrix linear programming software by [drive.google.com] based on the lp-solve package [sourceforge.net].
        4. lp_solve [lpsolve.sourceforge.ne]: A Mixed Integer Linear Programming (MILP) solver, which is open source and can be used for solving allocation and planning problems.
        5. GAMS (General Algebraic Modeling System) [gams.com]: Though not open source, GAMS is a powerful tool for formulating and solving linear programming problems and can be used for economic planning and resource

allocation.

6. SciPy: Specifically, the linprog function within SciPy, a Python library for mathematics, science, and engineering, can perform simple linear programming calculations and can be adapted for economic planning.

3. **Decided voting-protocol survey for participant decisioning.**
   i. Distributed autonomous digital ledger smart contacts, with code-based legal backing.
   ii. The stated method of governance of the group, with contractual legal backing.

4 The macro-economic structure of community

A.k.a., A macro-economic decision event system.

The decision system macro-economy (means of [habitat] production) may be subdivided at a high-level into a set of general production elements. These categories are akin to a narrative, which basically says, "As a community, what is technically possible is ..."

The core macro-economic sub-divisions are (Joseph, 2013):

1. **Global Resource Coordination (a.k.a., global resource management)** is the process of tracking resource usage, and hence, working to predict and avoid shortages and other foreseeable resource problems. The flow of resources is coordinated through openly trusted and emergently modified "designed-in" control.
   A. We identify what is available through continuous resource surveying/monitoring.
   B. Global resource management is integrated in the decision system for community into the parallel inquiry space in the form of a Resource Inquiry working group for identifying, surveying, and analyzing resources.
2. **Global Demand Assessment (a.k.a., global demand survey)** is the process of surveying, assessing, and realizing the demands of the human population. Herein, the system structures the transport of information so that everyone can be made aware of new technical possibilities, and there can exist system-wide [socially] optimal solutions on *how* and *what* to produce. The global demand assessment identifies and processes the *needs* and *preferences* of the community. In the accumulation of this information, we as a community find commonality [by measurable degree]. We refocus our awareness where necessary to determine new technical possibilities. When we share in our needs, then we may find we all equally share in our designs also.
   A. We inquire into our needs and the needs of our ecology, and we share the information.
   B. Global demand assessment is integrated in the decision system for community into the parallel inquiry space in the form of a continuous Issue Articulation Inquiry working group for identifying, surveying, and analyzing issues with human fulfillment.
3. **The Global Production and Distribution Protocols** are both a collaborative design interface (CDI) and a "convention" of trust agreements,

which form a habitat protocol on a network (of cities). Global design protocols create a platform for productive and distributive decisioning concerning changes to our habitat system. The protocols herein are encoded into the Community's decisioning system through a transparent and participatively formalized macro-calculation embedded in a parallel decision inquiry space, where solutions must value calculations done on them to support certainty in the selection of a solution meeting requirements.

A. **The Production Service Control System** is designed to optimally and scientifically engineer and manufacture solutions to socio-technical [economic] needs. The objective of the Production Management/Coordination System is accomplished through the application of three *production processes (i.e., strategies, values, operational values)*:
   1. **Strategic preservation (justice)** - maximize the preservation of resources and people, of human civilization and a healthy biosphere. This strategy involves a characteristic design protocol:
      i. Products (habitats and their sub-systems) are designed to "last" (i.e., longer usability & less maintenance).
   2. **Strategic freedom (with safety)** - minimize the damage to ourselves and our environmental habitat. This strategy involves a characteristic design protocol:
      i. Products (habitats and their sub-systems) are designed to be recyclable or decomposable.
   3. **Strategic efficiency** - increase efficiency for the mechanics of production and energy transformation itself. This strategy involves a characteristic design protocol - goods that evolve rapidly are designed to be automated, updatable, and modular so that they are adaptively responsive to individuals in the community. Herein, the "means of production", which refers to the actual tools and methods used in the production itself, are accounted for and optimized in their design as our technical capability advances. The "means of production" of anything is directly related to the state of technology and the underlying social conditions.
      i. Products (habitats and their sub-systems) are designed and operated in an optimized (technical) and intuitive (social) manner.

4. **The Global Access System** is designed around a macro-equative model (a formula or equation) that describes the flow of information and materials within each of the principle four economic sub-systems:

A. **The Resource Service Control System** exists as a series of information sensors (detectors or instruments) with the purpose of monitoring and tracking the location, consumption rates, regeneration rates, and recycling rates [within the hierarchy of decompositing/-ion systems], and hence, the probable predictive availability of access to common resources. "Resource management" is essentially the process of '**resource accounting**'. Resource accounting is the only possible way in which all of a community's common resources can be "made available to everyone". Sensors record data that may used to determine orientation (in space) and decisioning (by means of computation upon recorded and stored data to determine what actions are optimal for an intentionally set task). Resource accounting utilizes dynamic feedback from an Earth-wide/community-wide accounting system that shares data about all relevant [transactions of] resources. To whatever degree technically possible, all raw materials and related resources are traced as they move through the known systems, in as close to real-time as possible. Herein, a critical efficiency calculation for sustainability involves: (1) maintaining equilibrium with the Earth's regenerative processes; (2) maximizing the use of the most abundant materials; (3) minimizing anything with emerging scarcity. If the sharing of information is not acceptable in a society, or the medium (i.e., transport protocol) by which information is shared cannot be trusted, then it is wise to explore such a society's socio-economic system and introspect on the type of people it is likely to generate.

B. **The Material Inventory (or resource inventory)** - Material use per a given production output is strategically calculated to assure the use of the most conducive and abundant materials known. In other words, a material inventory exists (a.k.a., resource inventory) for use by a computing system that calculates the optimal transport and integration of material into the community's "materialized model", by item and by a set of factorial criteria, including but not limited to: (1) material integration durability (i.e., lifespan); (2) material recycle-ability (i.e., 'recyclability'); (3) material quantity; (4) material accessibility (temporal and spatial); and (5) material regeneration rates (i.e., abundance). Products would be designed to be both durable and recyclable, since the product's entire lifecycle would be designed by the community of users of the service themselves. Why would we cooperatively design otherwise? The criteria can be generally categorized into two different types: **conduciveness/applicability** and **abundance.** The two basic questions are: What is the "conduciveness/applicability" of this material to the projected service? And the second is, what is the material's overall state of "abundance"? Here, 'conduciveness' relates to the functionality of the proposed use of the material (i.e., how functional is the material?); and it based on the material's properties, the properties of other materials, and the identified design requirements? 'Applicability' is similar to 'conduciveness'; it refers to how relevant a particular material is to a given application. 'Abundance' refers to how much of a material is available, and hence, its rate/ dynamic of regeneration (or "scarcity"). Herein, materials are compared by calculation of the available data. In other words, what occurs may be referred to as a 'synergistic efficiency comparison' between materials and their ability to fulfill requirements.

Herein, technical product[ive] objects have:

1. **Attributes:** such as lifespan, maximum size, minimum size, maximum temp, minimum temp, etc.
2. **Relations:** such as "a kind of", "is a part of", and "has parts", etc.
3. **Behavioral functions:** such as co-occurrences, becomes, evolves from, and affects.

5. **The Demand and Distribution Tracking System** tracks the populations needs and distributes goods and services in an optimal, preferential, and systematized manner. The "demand" aspect of the system is informed by the population's inquired needs (i.e., "demands"). The 'distribution' element follows a **strategic proximity strategy** that seeks the localized cradle-to-cradle usage and recycling of good /services in an effort to minimize energy expenditure and optimize sustainability. Herein, 'localization' refers to the use and regeneration of resources as close as proximity will possibly (i.e., technically) allow, which reduces the transportation requirements of resources. The distribution of goods and services occur through 'general' and 'special' *distribution centers*. A distribution center is essentially a "check-out" facility, akin to a library. 'General distribution centers' exist to distribute personal and community access goods and services of a 'non-geographic use' specific nature. 'Special distribution centers' exist in areas where certain, specialized goods are utilized (saves energy & less transport), these have a 'geographic use' specific nature.
6. **The Collaborative Design Interface (CDI)** - This interface is part of the [user] front-end of the decision system. It visualizes the collaborative demand-design dynamic of the community. The CDI could be considered the "new market", the market of ideas and designs, of needs and solutions – it is a market for sharing in, not a market for competition. If hierarchy does appear, then competition for the redesign of the system toward greater neutrality will naturally emerge for the structure facilitates such adaptation. After demand (or need), design is the first intentional step in decisioning. This interface can be engaged by a single person or by interdisciplinary teams; it may be participated in by everyone. It is a single contribution interface with a framework capable of supporting coders, designers, editors, and end users.
   The natural environment regenerates our lifeground and it gives us back information (Read: negative feedback; signals) after we have made a change.

Table 1. *Accountable operational processes for coordination and control of habitat resources.*

Access Service Control Types	Control protocols
Resource service control	Resource Accounting
Production service control	Strategic design
	Strategic preservation
	Strategic safety
	Strategic efficiency
Demand and Distribution service control	Strategic proximity

4.1 The global production and distribution service architecture

The principal architectural layers of a global production and distribution service include:

1. **Design services:** These computing systems allow for the development and sharing of workable designs. The CDI (or collaborative design interface) is an open source environment, and accompanying computing interface, that facilitates networked, computer-aided design.
2. **Production services and locations (fabrication centers):** These structures facilitate the material

manufacturing and fabrication of a given design. These are likely to evolve into automated service production centers (i.e., "automated factories") that are increasingly able to produce more with fewer material inputs and fewer machine configurations. In community, we desire to rationally and consciously overcome unnecessary design complexities, we can further this efficiency trend with an ever lower environmental impact and ever lower resource use per task, while maximizing our abundance producing potential. Over time, production facilities move toward increasingly less [cybernated] variability as they become more efficient; therein, paradigmatic re-orientations of design change the potential variability in the system by changing its map of the territory, its relational environmental perspective. Each of these facilities has a spatial location strategically planned and distributed topographically. Note that the location and operation of all production facilities also involve a "proximity strategy".

A. **Recycling facilities** and decomposition spaces exist as part of the design of the production facility. As noted in the design protocol, all goods have been pre-optimized for 'conducive recycling'. The resiliency goal here is a zero-waste economy, like nature (a "true economy"). Everything goes back to a recycling facility, likely the point of origin, which will directly reprocess any item as best it can. Of course, an item may be returned elsewhere if needed; the integrated and standardized production and recycling centers having been conceived of as a complete, compatible and holistic system, that would be able to handle returned goods optimally, which is not the case in early 21st century society.

3. **Distribution services and locations (including distribution networks, access centers, and and storage centers):** These structures facilitate the actual distribution of a given product. Distribution can occur: (1) directly from the production facility, which is usually in case with on-demand, one-off production for custom use, or (2) it may be distributed to a distribution library for access, based on regional demand interest. It is worth reiterating that regardless of whether the good is allocated to a library or immediately occupied by a user, the whole system is still an 'access system'. In other words, at any time, the user of the customized or mass produced good can return the item for reprocessing or restocking (unlike in the market, where ownership entails responsibilities).

4.1.1 Community access elements

The primary elements of community access are:

1. **Location** is based on the logical proximity of a population concentration to a need. This is best exemplified with the current practice today of (usually) placing grocery stores in average convenience about a community, and placing heavy industry away from residences.
   A. In a planned habitat, all locations are designed and planned during the design of the integrated service system, and the internal system can modify and adapt its spaces where necessary and flexible to accommodate new forms of integrations.
2. **Method of access** is best described "as ease of access". Community is a shared, distributed logistically-oriented "library" system. This isn't to imply that all items retrieved must be "returned" to what might be called "access centers", but to show that they can be for convenience. It is certainly a welcomed practice since this process of "sharing" is a powerful enabler of further access efficiency, which is shared in turn. In other words, fewer goods are needed to meet the interests of more of the population through a trusted system of sharing.
   A. In community, there is no resale value in the system since there is no money. Therefore, the idea of hoarding anything would be an inconvenience, rather than an advantage. In the state of access, we ask ourselves, "How do we want our services distributed? Do we want them distributed directly to a our self at its present spatial location, or do we want it distributed to a specific location that "enables" access?"
   B. Herein, the community's inventory system includes a design profile for every productive service known and available.
3. **Tracking and feedback** is an integral part of keeping the system, both regional and global, as fluidly distributed as possible, when it comes to not only the meeting of regional demand through adequate supply, but also keeping pace with changes in extraction, production, distribution technology and new demands. Tracking and feedback require a variety of sensor systems. Fundamentally, what can be tracked depends upon what software is available, what hardware is available, where sensors are placed, and how teams use and respond to the data.
   A. The global resource management architecture maintains a sensor and measurement system that provides feedback and information about the current state of resources and

the environment, in general. This sensor network may be divided by spatial location, the [method of] access to the protocol itself, as well as the ability to audit [information packet] transactions, and correct for feedback.

Scholarly references (cited in document)

- Keeny, R.L., Gregory, R.S. (2004). *Selecting Attributes to Measure the Achievement of Objectives*. The Spanish University, Department of Artificial Intelligence. http://www.dia.fi.upm.es/~jafernan/teaching/sistemasayudadecision/Keeney-Gregory-attributes_OR.pdf
- Kouchaki, M., Smith-Crowe, K., Brief, A. P., & Sousa, C. (2013). *Seeing green: Mere exposure to money triggers a business decision frame and unethical outcomes*. Organizational Behavior and Human Decision Processes, 121(1), 53-61. https://doi.org/doi.org/10.1016/j.obhdp.2012.12.002
- Saad, G., Russo, J.E., (1996). *Stopping criteria in sequential choice*. Organization behavior and human decision processes. Vol. 67. No. 3. pp258-270. https://doi.org/10.1006/obhd.1996.0078
- Vohs, K., Baumeister, R., Twenge, J. (2005). *Decision Fatigue Exhausts Self-Regulatory Resources - But So Does Accommodating to Unchosen Alternatives*. https://www.researchgate.net/publication/237738528_Decision_Fatigue_Exhausts_Self-Regulatory_Resources_-_But_So_Does_Accommodating_to_Unchosen_Alternatives
- Wang, Y., Wang, Y., Patel, S., Patel, D. (2006). *A Layered Reference Model of the Brain (LRMB)*. IEEE Transactions on Systems, Man, and Cybernetics - Part C: Applications and Reviews. Vol. 36, No. 2. http://www.ucalgary.ca/icic/files/icic/28-IEEE%20TSMCC-LRMB.pdf

Scholarly references (non-cited)

- Vohs, K., Baumeister, R., Twenge, J. et al. (2008). *Making Choices Impairs Subsequent Self-Control: A Limited-Resource Account of Decision Making, Self-Regulation, and Active Initiative. Journal of Personality and Social Psychology*. Vol. 94, No. 5. https://doi.org/10.1037/0022-3514.94.5.883 | http://assets.csom.umn.edu/assets/113144.pdf
- Novack, J.D., Canas, A.J. (2008). *The Theory Underlying Concept Maps and How to Construct and Use Them. Technical Report IHMC CmapTools 2006-01 Rev 01-2008*. Florida Institute for Human and Machine Cognition. http://cmap.ihmc.us/Publications/researchpapers/TheoryUnderlyingConceptMaps.pdf
- Peixoto, T.P., Bornholdt, S. (2012). *No need for conspiracy: Self-organized cartel formation in a modified trust game*. Phys. Rev. Lett. 108, 218702. http://arxiv.org/abs/1201.3798

Online references *(cited in document)*

- Gray, Peter. (2023). *#21. The Play Theory of Hunter-Gatherer Egalitarianism*. Play Makes Us Human. https://petergray.substack.com
- Joseph, P. (2013). *Economic Calculation in a Natural Law / RBE, Peter Joseph, The Zeitgeist Movement, Berlin.* Accessed: January 7, 2020. https://youtu.be/K9FDIne7M9o | http://theeconomicrealms.blogspot.com/2014/06/peter-joseph-on-economic-calculation-in.html

Book references *(cited in document)*

- Fips, C. (2012). E*volutionaries: Unlocking the Spiritual and Cultural Potential of Science's Greatest Idea.* Harper Perennial
- Howard, R.A., Abbas, A.E. (2015). *Foundations of Decision Analysis*. Pearson.
- Piketty, T. (2015). *The economics of inequality*. Belknap Press.

Decisioning in a Community-Type Society

Travis A. Grant,

Affiliation contacts: *trvsgrant@gmail.com*

Version Accepted: 1 April 2024

Acceptance Event: *Project coordinator acceptance*

Last Working Integration Point: *Project coordinator integration*

Keywords: decision, decision modeling, decision resolution, decision arrival, decision support, decision space, decision solution, decision making, decision taking, decision method, choosing, issue resolution, distributive justice operation, distributive justice service, governance modeling, economic modeling, socio-economic decision modeling, master-plan decisioning, master planning,

Abstract

It is likely that a community-type society would model and visualize its decision system in order to ensure an understandable and verifiable outcome. The decisioning process of a society can be described and modeled. The useful result of modeling is a decision support system by which decisions are algorithmically processed for some decisioning entity. Once there is realization of decisioning, there may emerge realization of decision support. There are decision support technologies, including computational and storage systems. By understanding what a decision is, it is possible to configure a decision system so that it embeds cleanly in an adaptive societal system. If decisions are not well understood, then behaviors are unlikely to be well understood. A societal decision system involves logic that integrates values, issues, and knowledge into decided solutions that are executed in the material domain.

Graphical Abstract

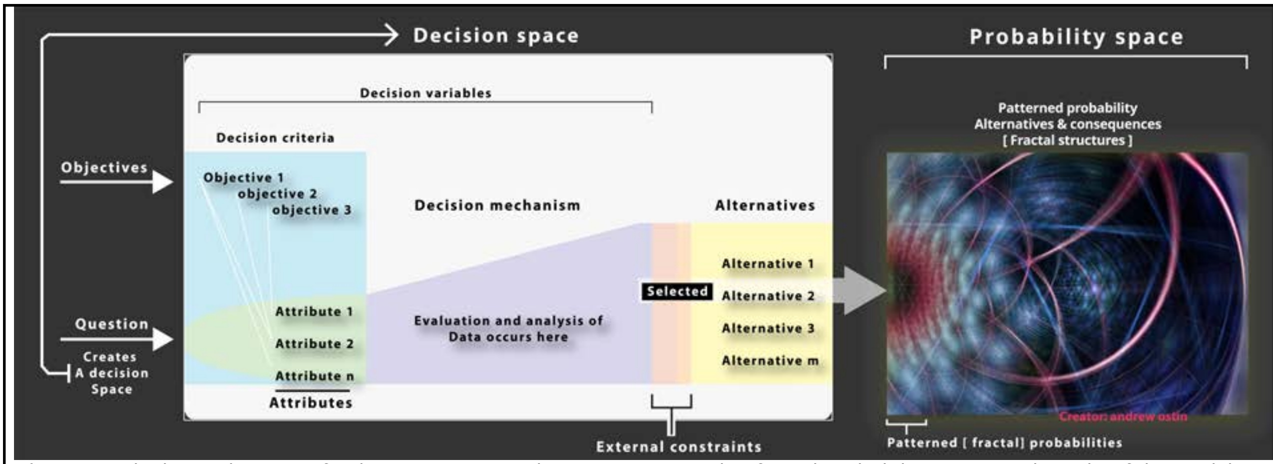

Figure 5. *The basic elements of a decision space (or decision system) with a fractal probability space on the right of the model. Here, a decision environment is resolved through the selection of one of several alternative solutions after the use of a method has been applied to integrate all relevant information and produce the alternatives.*

1 The classification of the decision [support] service system

The decision system for a community-type society may be sub-classified in four primary ways. A decision system at the level of resources is an economic system, and at the level of the user it is an access system. However, before a community-type societal system can usefully encode the concepts of access and economics, it must first apply the fundamental methodology from the social system, the systems approach. The decision system for a community-type society is a systems-based model; it is also an access-based model, a resource-based model, and a participatory-based model. These are the decision system's primary economic classification types. The decision system is a system's based system, because it accounts, systematically, for all societal-level (or, societal-significant) decisions. The outputs of decisions of the societal system are accessible by users. The outputs of decisions reshape the material and informational environment, and in doing so, resources are moved and transitioned. In order for a community-type society to function, the individuals therein must participate in the system's sustained operation. Contribution optimizes demands in a social resource environment.

> **IMPORTANT:** *The built environment in community, because it uses common heritage resources and impacts both local and global fulfillment, must be planned at an appropriate scale of periodicity (cycle). In community, the built environment is the product of master-planning on a cyclical basis, with appropriate flexibility between.*

Economic decision models may be classified by the [architectural] function(s) they serve. The decision system model herein functions to provide a community population with access to common resources while operating a habitat service system based upon servicing the needs of individuals as they expend effort toward their higher potentials. Herein, humans have a need for common heritage resources to be transformed into accessible goods and services through contribution to a systems-based approach. Decisioning becomes transparent, coherent, and accountable. It involves participation and conveys confidence and trust to the population.

> **QUESTIONS:** *What do decisions look like at the individual and societal scale when the market-State is taken entirely out of the decision? What modes of organization, coordination, and decisioning will be most effective for human need fulfillment under the value conditions of community?*

The model may be classified (categorized) in four principal ways:

1. **Systems-based model** - Essentially, the model is a "true" systems-based model as it applies technical system's principles to inform the programmatically systematic method it uses to arrive at, or "framework", economic decisions toward the engineered fulfillment of human needs. It models systems dynamics and is systematically adaptable; it is solutions-based. A solutions-based system presumes the answer to a problem is possible, and that a platform is needed for its discovery from an existent environment that may be experienced with some degree of [navigational] accuracy. In its functional role as a systems-based economic model for human fulfillment, the decision system may also be referred to as a *needs-based model*, because living systems have needs, they have requirements for living, and specific requirements for living well. Here, the systems-level of decisioning in society, there is an InterSystem [societal team] coordination for actual economic coordination of common heritage resources through habitat services under a single planetary ecology.
   A. The economic decision system is structured from a 'systems' perspective, and following systems-based principles and practices.
      1. There is decisioning about the acquisition and transformation of resources into needed goods and services in local resident customized habitats.
   B. The model provides a systems-based function.
      1. Societal information-intelligence standard.
         i. The overview of the [societal] system.
         ii. The project plan for the vision and execution of the transition to, and operation of, the vision.
            1. The social system standard.
            2. The societal information standard.
               a. The textual part.
               b. The 2D concept-model ('figure') part.
               c. The 3D object-model ('object') part.
               d. The 4D simulation-model ('action') part.
            3. The societal surveyors.
               a. Societal data collections and analysis.
         iii. The decision system standard.
            1. Decision working groups.
               a. Global resource planning protocols.
               b. Local aesthetic and functional master planning by residents.
               c. Local agreement to behavioral standards as conveyed in a set of "signed" by-law agreements.
         iv. The material system standard.
            1. The habitat service systems (and habitat

service team members).
2. The habitat operational manuals (the team members' knowledge).
v. The lifestyle system standard.
2. Decision system-user agreement protocol to develop local and global economic master-plans.
i. Users residing in local habitats have needs and expectations for aesthetic and functional operation of their local habitat. The user has habitat-level aesthetic customization design decision influence, and legal-level behavioral agreement of consent to reside in the local habitat.
1. Have a permanent residence in community, wherein a personal resident in community goes through four phases of life):
a. Nurturing.
b. Educating.
c. Contributing.
d. Leisuring.
2. As a visitor (i.e., permanent resident in community and visitor to a local habitat not one's own). A visitor is a community resident visiting a dwelling-like sleep and personal-storage location other than their local personal-habitat dwelling.
a. Visitors: may be of any of the life-phase categories: nurtured (young, or visiting family), educated, do contribution, and leisure.
3. A local permanent resident "resides" is the location where the user has domain over as a 'personal space', per agreement to the local habitat by-law set of agreements.
3. Habitat service system operations for local life-service, technology-service, and exploratory-service fulfillment.
i. Users have local socio-technical needs and expected habitat services throughout life[-phases].
2. **Access-based model** - The term 'economy' is not uni-dimensional, uni-conceptual or uni-factorial. Hence, an economy is not just capitalism or socialism. To claim that it is would be a bit disingenuous; and to believe that it is would mean buying into a conditioned illusory reality that is not systematically open to a greater commonly verifiable experience. Instead of polarity, it may be easier to think of the socio-economic system herein as a complex interplay of applied conceptualizations and dynamic processes, which form an access system of some type (the type that allows embodied consciousness to access common material resources in abundance). There are many forms of access, and hence, many types (or classifications) of access system.
A. The [economic] decision system accounts for access.
B. The model provides an access-based function.
3. **Resource-based model** - A resource-based economy is one type of access system. It is an access system that caretakes (or stewards) and accounts for a common resource pool while providing access fulfillment to economic needs without exchange (i.e., without the market) in an optimized technical manner forming [at scale] into an integrated city-living habitat environment.
A. The [economic] decision system accounts for resource.
B. The model provides a resource-based function.
4. **Participatory-based model (contributory-**

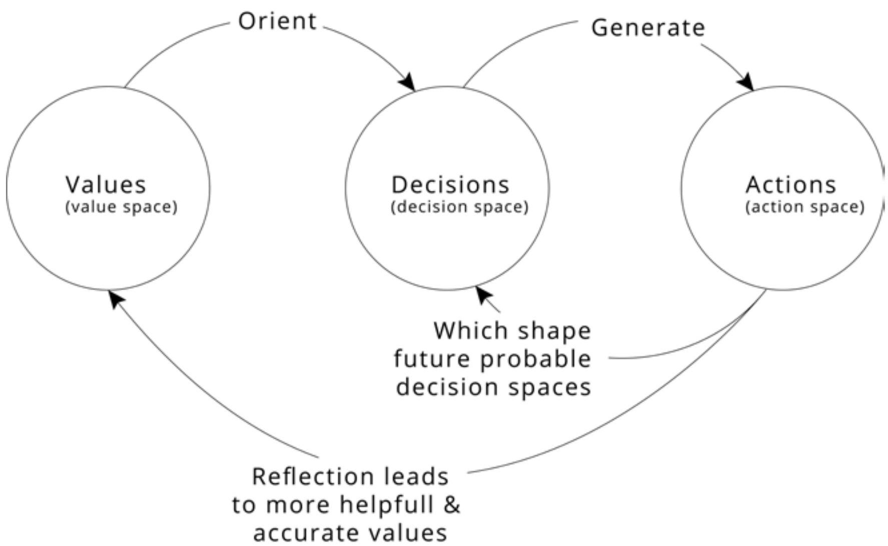

Figure 6. *Values orient a decision space for more accurately predicting future probable spaces, by means of actions generated as a result of decisions. Actions lead to different future probabilities, and reflections upon action may update values.*

based model) - Participation means two things. First, it means willing-intentional participation in decisioning and production. In the context of production, it means that the model is organized around human contribution to standards, decisions, and production. In the context of personal dwelling work, it means contribution to the work that sustains the local family and its dwelling space. Participation also means participation in society as a user -- following personal- and common-access user protocols/agreements. In the context of user decisioning, it means participating in necessary decision inquiries (e.g., maintaining a habitat profile, completing consumer/user surveys, articulating issues with informational and material systems, etc.). Participation is necessary for the continuation of any common material system. A resource-based economy is a voluntary (or volitional) participation/contribution model. Herein, the decision system is designed to transparently account for the existence or non-existence of participation in the system by which economic needs are fulfilled. This is a direct, participatory economic system, more precisely it a direct contribution-by-user economic system). There is participation in the form of contribution and in the form of human need and preference accounting.
   A. The [economic] decision system accounts for participation.
   B. The model provides a contribution-based function.

This economic decision system is designed to “do away with” all forms of politics and political systems of thinking, all forms of market economics, and all State (governmental) control; it is not a game of persuasion, ownership, or coercion. It involves a different conceptual set of understandings. These understandings form a type of economy that behaves like a holistic unit to materialize mutually beneficial and optimized fulfillment for everyone with consideration given to the environment in which the materialization is occurring. Herein, if problems exist, then they exist to challenge everyone to develop a comprehensive solution without reducing anyone’s fulfillment in the process.

Summarily, decisioning is:

1. Systematic in concern to looking at the real-world, sharing data, and designing socio-technical systems in a systematic manner; which, conveys many benefits to human freedom, restorative and distributive justice, and efficiency.
2. Based on resources (Read: resource accounting), because all activity in the material environment (e.g., a real-world habitat service system) requires resources.
3. Based on access to a material service environment through master planned and selected proposals for habitats in a network.
4. Based on participation within two domains of life:
   A. Personal and common user access.
   B. Contribution Team Access via the InterSystem team.

In order to create a workable and optimized economy, the economic development must:

1. Model and simulate [the economy]: Mathematical modeling and simulation techniques are utilized to understand and predict the behavior of production systems, analyze resource utilization, and optimize internal processes.
2. Control [the economy]: In scenarios where precise control of production processes is necessary, mathematical tools are applied to design controllers, regulate system behavior, and ensure stability in production systems.

3. The document "Auravana Project - Decision System" presents an exhaustive overview of the decision-making framework within a community-oriented society, emphasizing a systems-based approach to economic decision-making, societal stability, and environmental sustainability. It is structured around several key components: the conceptualization of decisions within societal contexts, decision modeling for societal stability, economic decision systems emphasizing various economic models, and the implications of decision-making on community structures and societal interactions. Additionally, it delves into global parallel decision resolution inquiry, solution inquiry accounting, and extensive accounts on need and preference, access, technology, resource, and environmental inquiries.

Decisioning in community is a holistic and integrative approach to living together in society, focusing on the optimization of decision spaces, acceptance of change, rational decision modeling, and the impact of socio-technical systems on decisioning processes. The decision system is a comprehensive economic decision system that includes linear and circular economies, socio-economic planning, and the macro-economic structure of habitats, aiming for societal sustainability and the minimization of environmental impacts, while meeting the global optimal fulfillment needs of the population.

2 A systems-based economic [decisioning] model

CLARIFICATION: *The decision system is based on the language of systems in order to understand and decide problems systematically.*

Systems-based models recognize and adhere to systems principles (systems dynamics) in the application of effort. Herein, the system [dynamic] is seen as the source of its own problems, which allows for a volitionally iterative design orientation (e.g., intrinsic motivation). From the perspective of understanding the underlying causations to problems in our fulfillment it is imperative to examine the problems more closely. Because, if we do not understand the causations to the problems we cannot hope to solve them. Similarly, if the structure of a difficult problem is not understood, then the problem cannot be solved. By applying principles from societal systems science, planners and policymakers can design and operate habitat systems that align with the values of freedom, justice, efficiency, and sustainability, ultimately fostering a livable and resilient community network of habitats. Societal systems science plays a crucial role in understanding the complex interplay between human behavior, societal structures, and the built [material] environment in creating sustainable human need fulfillment systems. By employing a unifying and integrating approach, it is possible to analyze and optimize the intricate relationships among urban design, social dynamics, and environmental constraining factors.

Like every important model in community, this economic model is a systems-based model, and it involves multiple different inputs, processes, and outputs, multiple entities, linkages, and boundaries. It is a system whose inputs include data relevant to issues, needs, and decisions. Its outputs involve, though are not limited to: the allocation of socio-technical resources toward the access of goods and services in the form of operative habitat designs.

This economic decision model is understood through its relation to the larger model (or system) of which it is a part, the real-world community information systems model. In the material system of the model, there are a network of socio-technical habitats in which people live. The word habitat is just a synonym for city, village, etc. Each habitat is customized to the preferences of those people living in that habitat. It is developed and operated through master plans, and those master plans are changed every set number of years as specified in the residency agreements for that habitat. In community, there are needs and preferences; there are no wants (as there are in the market-State). The market-State is the name of the type of society we are living in now. The type of future society I am describing here is technically called a community-type society, or a community-type configuration of society. Habitats in community are necessarily open source creations and operations, so residents and decision working groups can take informed and optimized decisions.

Every systems-based approach requires a recognition of the recurring patterns of relationships (i.e., intuitive thinking) within and between systems. A systems approach necessitates a perspective that accounts for the overall architectural structure, patterns and cycles in a system rather than seeing only specific events in the system in isolation. This leads to issue resolutions (as solution orientations) that account for problems throughout the system, while recognizing the interaction between a particular system and its environment.

A system is classified as robust when it does not oscillate between conservatism and fire-fighting. A functioning system must have a way of knowing if it is neglecting information, it must be open and accept feedback. A system is negligent (or "ignoring") when it is excluding information necessary for its most effective operation.

The decision system is a system that recognizes that there exist technical systems principles that when integrated into an encodable system, maintain the potential for an adaptive, optimal and regenerative state of fulfillment - a system capable of fulfilling our highest potential needs.

All systems are composed of individual parts. Something arranges the parts into a structure (a "constructor"). The structure determines the behavior of the system. *System analysis* is a matter of identifying the relevant structure of the system and its most important parts. From that knowledge consciousness may

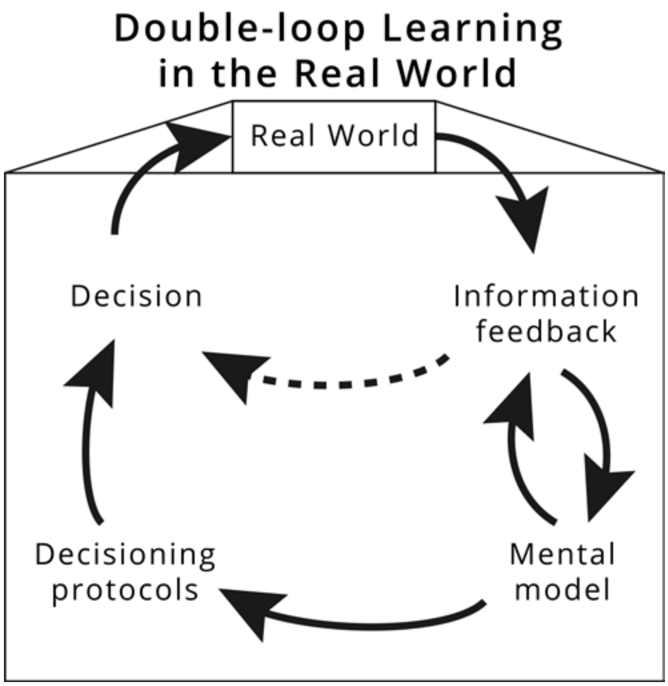

Figure 7. *Rational double-loop learning applied to decisioning in the real world in order to feed back information to improve the whole system.*

synthesize an understanding of the system's generative behaviors (i.e., the behaviors it is likely to generate in a consciousness experiencing it). Fundamentally, we know the system by the [behavioral] results it produces.

The idea of an emergent behavior concerns the arrangement of the parts, and not just the parts themselves. The chemicals in the human body can be purchased. Buying them and mixing them up in a bucket would not create a person. It is structure that makes all the difference. It is important to know how an environment is structured if its emergent behaviors are to have some degree of [design] predictability. The concept of emergent behavior is crucially important in solving systemic sustainability problems, for it is in fact emergent behaviors that drive such problems. The structure of the system as a whole must be examined if root causes are to be understood and the community's orientation redefined toward states of greater fulfillment and sustainability.

At the core of the concept of 'systems thinking' is the concept that the behavior of a system is an emergent property of its structure, not its parts. Thus, problem-symptoms are emergent behaviors. Each behavioral symptom can be traced to particular aspects of the structure. It follows that if someone does not know the structure of a complex social issue or system problem, then they will be unable to re-solve the root problem. Hence, a community with a solution orientation seeks to understand the root source(s) that generate the manifestation of a particular set of materialized behaviors.

The purpose of a system is what it does. If a system produces war, then it is structured to do so. People may imagine that the system they live under, their society, has not been designed to produce conflict and competition and violence, but if that is the result, then their imaginings are just that, imaginings. People can imagine what they like, their imaginations do not have to accord in any way with the reality and behavioral consequences of the societal structure that they live within [and may have been conditioned to accept and believe to be different than that which it actually is].

The consequences of the system are just that, the consequences of the system; the consequences cannot be said to arise "just because we are not doing it right" (i.e., are not doing democracy, government, and the market right). If we are to understand the world around us, then we need to cut through (i.e., discern) the nonsense and propaganda that is used to describe any system. The sense of offense that one might feel over this stated understanding is in fact the system reinforcing itself -- a system that lacks a mechanism for corrective feedback. Once the non-corrective paradigm of thought has been integrated into someone's thinking processes, then those too will lack corrective feedback, which maintains the establishment of a self-reinforcing paradigm of thought based on limitation.

Information in an optimized economic system is radically distributed wherein computation, storage, and communications capacity are "in the hands" of practically every connected person sharing in the community. In truth, these are the basic "capital needs" necessary for producing the persistence of community - common access to information organization generates an **information economy**. In an open-source community all important activities concerning the core [information] economy are in the hands of the population; not only *content* and *process*, but *relevance* also. An information economy has the potential to become one emergently discovered and applied system. In an information-based society, the decisions taken are based upon the information available.

In a system, a 'governing mechanism' (or 'governing dynamic mechanism') coordinates the flow of resources through the system by means of access to correctable fed-back information from an environment. In a system, the idea of 'governing' refers to the re-formalized modulation of the dynamics of the system to meet the objective(s) of the system itself.

Fundamentally, systems-based decisioning involves the following three elements:

1. **Systems have dynamics.** Systems have processes that may be active or inactive.
2. **Systems have preferential outcomes** (objectives or goals), which are regulated to some degree by the dynamics of the system. In other words, there are outcomes that the system would like to see expressed and the system maintains processes to facilitate its desired outcomes. In the case of competing market entities, the outcome the entities would like to see expressed is profit. In the case of a corporation, the desired outcome is profit maximization. In the case of an entity that monopolizes power (i.e., a government), the outcome is social control. In the case of the Community it is human fulfillment and well-being.
3. **Systems have a decision space** with decision variables, which are the choices that the entity (or system) has to make (or can probabilistically arrive at). For example, in the case of a business a basic variable is that of hiring and firing labor. A rational system wants to make these choices in such a way that the result is the maximization of its purpose, goals, and values. In the case of a business, the purpose is to make money -- the fundamental and direct purpose of a business is to make money. If you ask a business owner, "If you don't make money, what will happen?" The business owner will tell you, "I will go out of business". If you ask a business owner, "Would you like to make more money, while maintaining the value set and quality of product you currently maintain?" A rational business owner is more than likely going to say,

> "Yes, of course; that which will allow a business to survive is that which will make the most profit."
> To survive a business must look out for its own interests. Therefore, logically speaking, business doesn't want people to know when their products cause bad outcomes because that would be "bad for business". Rationality will create corrupt incentives within a corrupted decision space.

An economic system based on systems principles will adapt itself based on evidence. If humanity wants different outcomes from a situation, humanity has to change the system that underpins the situation in such a way that it delivers different outputs.

If you know the dynamics of a system and you can build a simulator for it, then all you have to do [conceptually] for all the different possible actions you can take, is to model them out (or 'simulate' them) and see which ones are more likely to lead to the goals which you want. Essentially, simulation leads to better modeling, understanding, and performance, as well as more precise engineering solutions, and in general, more rationally decisive action [through visual analysis and logical feedback]. Fundamentally, an integrated simulation leads to better design solutions. Also, a visual display of the different components in the simulation leads to better communication between all the people involved.

At the community level it is unwise to deal with the parts of a situation in isolation; we ought to handle them

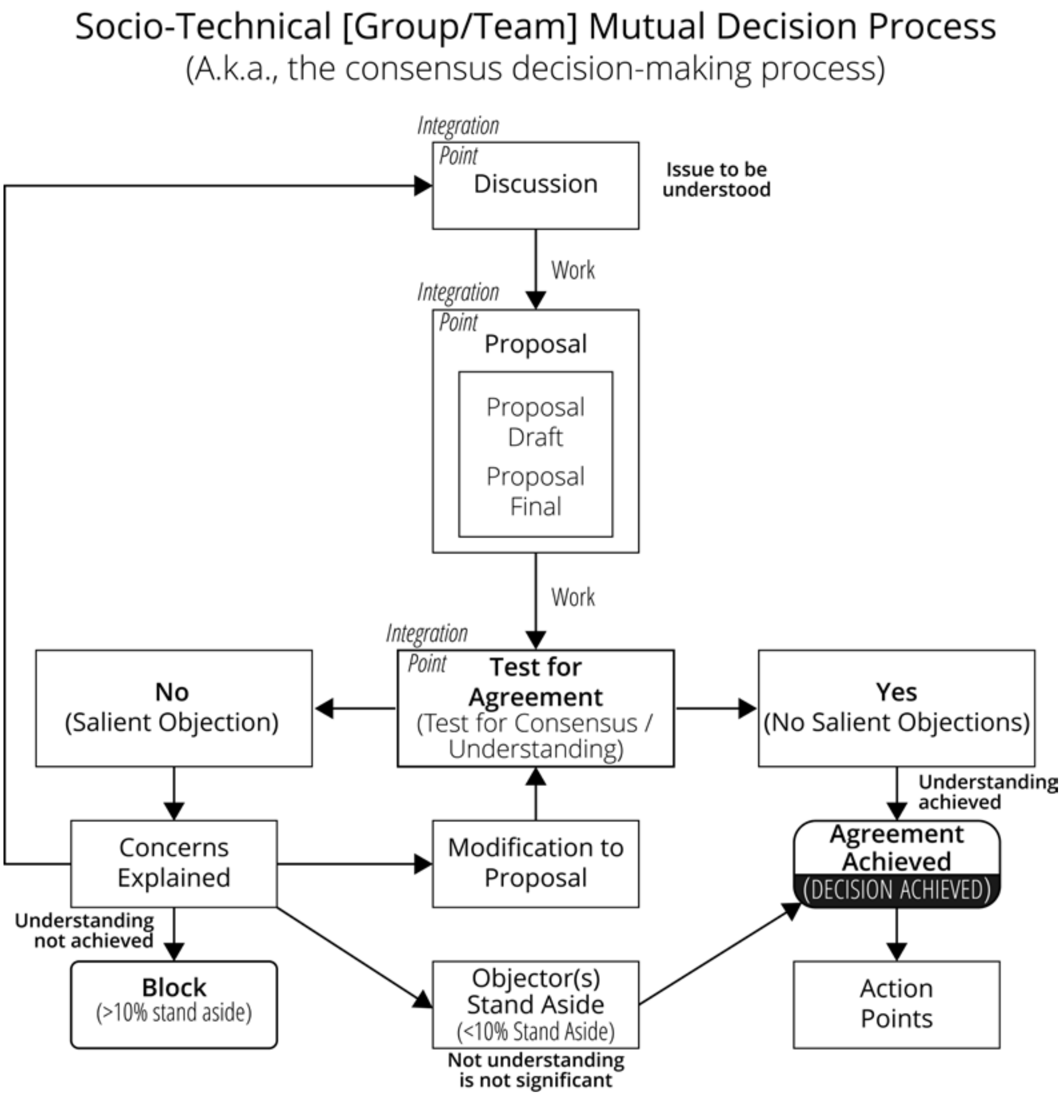

Figure 8. *Flow diagram depicting the mutual decisioning process that occurs in most team settings under community-type societal conditions. Team discuss issues. Teams propose information. Teams integrate information together. Teams test/question each other for consent, agreement, and understanding. Team members may or may not have objections. Proposals may be modified once concerns are explained. Actions are based upon achieved and agreed decisions.*

in concert. We have to deal with both the elements of a situation and how they interact with one another -- we can simulate their synthesis.

This decision system could be named a "deterministic system" because an individual with sufficient knowledge about the operation of the system, its inputs and processes, could determine to some "certain" degree the outcomes and outputs of the system. In a "deterministic system", if starting conditions are known in enough detail, then the outcomes of events from the system can be predicted [by variable degree]. Technically engineered systems are deterministic systems. They are deterministically designed through systematic organization and structuring of cause and effect. It is relevant to note herein that the concept of a "deterministic system" should not be confused with the belief system known as "determinism". Instead, all engineered systems are intentionally determined systems (i.e., deterministic systems).

The five systems principles for a stable economy include, but are not limited to:

1. The economy serves the individuals in a community; the individual does not serve the economy.
2. Development is about the individual and the social, and not about objects.
3. Growth is not the same as development, and development does not necessarily require [economic] growth. Growth is a quantitative acquisition. Every living system in nature grows up to a certain point, and then stops growing; but we (individuals) continue developing ourselves. Development has no limits; growth has limits.
4. No economy is possible in the absence of ecosystem services.
5. The economy is a subsystem of a larger finite system, the biosphere; hence, infinite growth is impossible.

Donella Meadows (2013) observed:

> *"To a systems thinker, it is just crazy to talk about tradeoffs between the economy and the environment. It's just even a thinkable thing, because the economy and the environment are so clearly one integrated system. It is surprising, once you really get into systems, how often you hear people talking about trading off one part of a system with another, when you see very clearly that there is an assumed reductionism, separation between parts of the system, that just aren't so in the real world.*

To effect real/actual system change (i.e., systemic change), the function or purpose of the system itself must be changed. The following system components determine a system's behavior and identify where to intervene (Meadows, 2013):

1. **Function** or **purpose** - The function/purpose fundamentally determines a systems behaviors. Note that a system may not be able to achieve its function/or purpose. If it can, the system will do what it is set up to do. To fundamentally change a system, this must be changed.
2. **Interconnections, relationships** - In other words, the structure, processes, feedbacks. and information flows. The behavior of a system can often be changed significantly just by changing the way information flows within it, or what information is available.
3. **Elements** - A change to elements is a low-level way of changing a system. Rarely, if nothing has changed above will a change here make a difference. Occasionally, however, a change here could affect the above components of a system, which will have a more significant impact on changing the system.
4. **Behaviors** - Everything above produces (given an environment) the behavior of a system. Simplistically, behaviors are general effect tendencies of a system over time.
5. **Events** - If the system is frozen at any point in time, it will be observed to be doing something, which is an event. Events are isolated "snippets" of the behavior of a system.

> **INSIGHT:** *There is no need to hoard; humanity can organize and share. There is no need to consume infinitely; humanity can prioritize and reach fulfillment.*

2.1 Cybernetics

Cybernetics is commonly considered a science concerned with the study of systems of any nature that are capable of receiving, storing and processing information so as to use it for control. In other words, it is the science of effective organization. To be effective there must be information about and control over systems. (Beer, 1979) Hence, cybernetics appears to provide a sound framework for organizing information and control in the economic problem domain.

In some sense, cybernetics is the application of systems science using complex machines. Therein, there are at least two ways to view "variety [of access]". First, "variety [of access]" in the market, where goods and services are traded in competition and scarcity. And secondly, "variety [of access]" in the sense of how systems scientists (e.g., Stafford Beer, Norbert Weiner, etc.) in cybernetics define the term "variety [of access]". In the market, variety refers to choice, such as the variety of coffee that someone can buy, or the variety of services that can be found; in this case, it is a euphemism for competition. Cybernetic's has a different definition of variety [of access]. In cybernetics, variety refers to the number of possible states of the [material and/or informational] system. Variety is a loosely defined as the number of different states ("status") a system can be in. In a cybernetic sense, different system states produce different types (quantities and qualities) of access (to habitat services). For example, a standard traffic light (or stop light) has three normal states: red; yellow; and green states. It has four states if there is an additional state where there is no colors displayed (state = off"). This is the systems 'variety'. If a driver approaches an intersection with a traffic light and wants to proceed through the intersection safely, then the driver must distinguish (or otherwise, understand) each of the different states of the traffic light system; otherwise the driver will not have control of [a decision space in] the situation, and the likelihood of an accident increases. The number of different states (or 'behaviors') of a complex dynamic system can be extremely large (e.g., the global climate). Community has variety, both in the sense of states of the social and technical systems, as well as a preference [inquiry] in the decision system for particular states of the material environment. Cybernetics offers a systems-based conceptual frameworks for understanding and improving design processes, and thus, their outcomes.

Based on the principles of communication and control, cybernetics can inform design [decisions] on at least three levels:

1. Modeling interaction: human-human; human-machine; or machine-machine.
2. Modeling the larger service systems in which much interaction takes place.
3. Modeling the design process itself.

In a cybernetic economic network, data would be automatically collected, reviewed, evaluated and used to calculate dynamic action plans meant to solve human economic problems and change the societal system's environment. These action plans may be calculated through computing systems and visualized for human understanding into intelligible graphs, figures and other forms.

Herein, cybernetic decisioning implies the use of environmental feedback loops to adapt new actions to the input, integration, and valuing/ re-orientation of the results of prior actions.

When the individuals among a societal population (i.e., persons within the collective) can relate performed actions to their consequences on the overall system condition, then they are able to 'learn', by means of action-impact-integration triad chains. During subsequent decisioning processes individuals may adapt by using this earlier integration of information to re-evaluate actions' utilities (priorities and processes/ activities) differently than before. Herein, certain activities can increase current and future fulfillment, and certain actions can hinder current and future fulfillment, of some user's set requirement of the cybernetic system. Given the information available, individuals can come together to form a model and algorithm that identifies mutual and optimal paths for fulfillment, computationally.

2.2 Habitat master decision planning service

A.k.a., Habitat master plan decisioning.

Community develops a comprehensive economic habitat service system plan (locally customized and globally common) that is oriented toward what the population needs (and prefers). And, what the population needs at a material level is: life support, technology support, and exploratory support, with life support ranked (ordered) as the priority access. Products produced and consumed in the economy have use (to the population) in these three need (for service) support categories. In community, decisioning concerning economic resource allocation is based on priority from emergencies to continuously operating as nominal [HSS team] services, to the strategic decisioning and planning of future services in the form of habitat socio-technical master plans. All habitat socio-technical plans account for

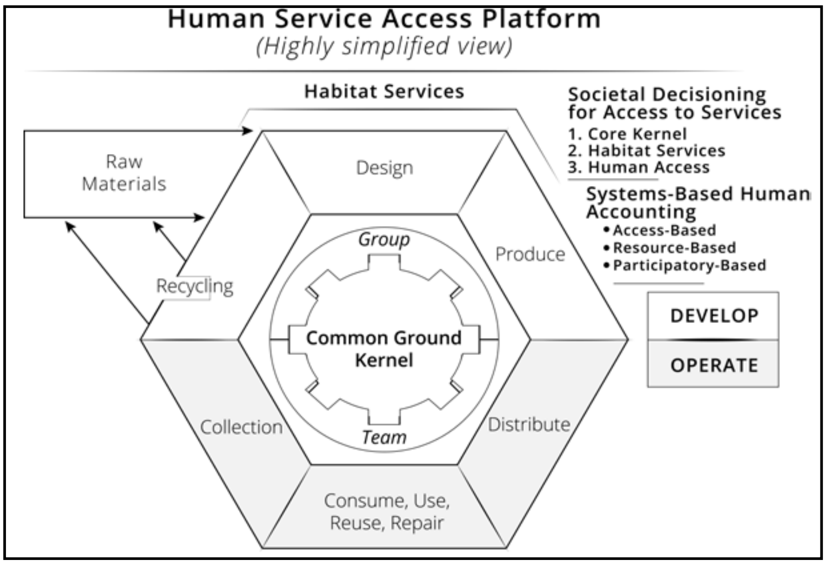

Figure 9. *A common kernel is designed and operated in order to solve for the optimal production of a life-cycling habitat service platform for humanity, developed and sustained by a working team.*

global resources and are customized to a local habitat residents and a local habitat region. All types of habitat are organized based on three primary service support systems that every habitat has as basic [human need fulfillment] operations: life-support, technology-support, and exploratory-support. All types of habitats are also sub-organized based on three primary operational processes: incident response, operations continuity, and strategic planning.

Changes to an adaptive societal system must be planned for, must be standardized, and new systems need to reflect more accurate models and up-to-date information. Hence, planning must be done in the presence of the whole. When it is done in isolation from the rest of the environment (from ecological concern and human interest) we cannot effectively prepare the next iteration of our habitat service system for the fulfillment of the whole of the community. Herein, planning is an element of any systems model that seeks to account for resource usage under conditions of technical economic efficiency. In other words, whatever planning we do, we must have the resources. As models evolve, so too do plans. All coordinated systems plan the allocation of their resources. Fundamental societal systems planning means to view society as an operational project that forms habitat services as planned.

A failure to plan for the future is a failure to plan for our own survival. We need a healthy environment to survive and we need a healthy mind in order to survive in our environment. This is the basis of logic as a tool which predicates human survival. What would happen if our ability to effectively plan for the future were undermined? We would have what we have here today in early 21st century society; a failure to facilitate community. A community needs intellectual fortitude to face uncertainty and wring from it the drops of knowledge which lead to understanding of its designs.

The decision system is part of a structure that is collaborative at the "global" systems level, at the level of the Habitat and larger ecology.

The degree to which individuals in a community have to plan their access (i.e., "consumption" - market economy term) depends upon a variety of factors, including but not limited to resource availability, technological capability, the prioritization and trending of particular needs, capacity and regeneration rates, and anticipatory emergency incidents.

And, it is interesting to note that planning [contextually] reduces the likelihood of decision fatigue (i.e., willpower fatigue) because the decisions are already made.

Each habitat service system maintains an integrated strategic plan to provide for the functional needs of the community and maintain alignment with the community's value system over time (i.e., temporally). In essence, a plan is simply a "next" iterative design (or iteration) of the total habitat service support system design.

Herein, planning is systematically organized (i.e., central and de-central; it is distributed) by an ecological habitat service system. At the habitat service system-level, planning occurs centrally to the habitat service system. The habitat service systems maintain interrelated strategic plans to ensure the continued fulfillment of human needs through dynamic design. There are plans, but there is also voluntary participation in the planning environment. Humankind's social and economic systems are not an exception to interdisciplinary ecological design.

There are many elements of early 21st century society that are planned, and that fact is not considered controversial. The existence of businesses, which plan their activities, demonstrates that so called "free market economies" are to a significant extent planned [in a hierarchical and industrially centralized manner (i.e., top-down vs. parallel planning)]. Who would argue for an unplanned rail or communications system? Who would argue for the unplanned design of a commercial electronic good? Who would argue that service-distribution requires planning? Who in their professional life does not work to a plan as a business plan or something similar? Who does not plan their travel? Who does not plan a design improvement or the modification of any system? Is city planning wrong in principle? What type of organization or system would take action without planning? Planning is essential for all organized effort toward a common objective, or purpose. It seems that we plan everything even remotely serious in our lives, or at least accept that we ought to plan for those things, but for some reason we draw the line at planning how we sustainably live on this finite planet and in our communities.

In every society, some actions are planned and others are not. Intrinsic spontaneity can be a joyful personal experience, but to base the organization of a society on it is folly. Fundamentally, it is rational to plan for the fulfillment of a community, and to not do so is likely to create anxiety, harmful levels of uncertainty and stress in the community, such that irrational actions are of a greater certainty. Chronic states of stress degrade optimal decisioning and interpersonal trust by provoking reactive (or "irrational") emotional responses -- they de-construct community.

It is true that personal spontaneity and future uncertainty can lead to emotional excitement; however, it is unwise for a community to maintain an economy based upon spontaneity and a high degree of uncertainty. The emotional excitement that stems from personally chosen spontaneity has the potential to add to the joy that someone experiences in their life, but when this emotional excitement comes at the expense of more primal fulfillment because the economic services and products are not planned for, then the community has a serious need/value prioritization issue on its hands.

Also, a functional system must maintain an adaptive feedback mechanism (i.e., a learning mechanism). When learning does not occur, plans do not improve and adaptation does not persist. When adaptation ceases, then 'self-preservation potential' decreases.

The acquisition of new and relevant information must be allowed to evolve and update any existent plans -- information transparency and sharing is salient. When a community forsakes planning, then it is essentially forsaking the concept of organized and coordinated effort toward a purpose. A failure to plan for the future is a failure to plan for our own survival.

Planning is necessary to ensure the strategic preservation of our community and our common heritage resources (i.e., a common pool of resources; resources that are commonly unowned). The preservation of resources is part of a larger community strategic preservation strategy for each of the habitats' systems. Such a preservation strategy is the opposite of the modern day profit strategy known as "planned obsolescence".

> **INSIGHT:** *If you have a plan in life, and you are using someone else's energy to accomplish it, then it is not a plan, it is a problem. Our goal should be to create our masterpiece (our self potential) from our passions and our efforts, which is a potential that nature provides.*

2.2.1 Habitat network operational processes, local and global

In community, there are both local [habitat] and global [habitat] network processes active simultaneously. Hence, there would need to be some unified information system for organizing all information available on the network. Local habitats provide physicalized services via habitat service teams who use common heritage resources and a community coordination structure. There is also a global network of available information, and physical resources and technologies (including computational, electrical, etc.). Hence, there is an accounting for needs, requirements, resources, and information at both the global and local scales. The local scale is the immediate interface, the habitat service platform, that provides physicality to fulfillment. At the global scale is a network of objects and processes coordinated into a configuration that meets global human need fulfillment requirements.

Hence, the habitat system includes the following 2 (by 2) elements:

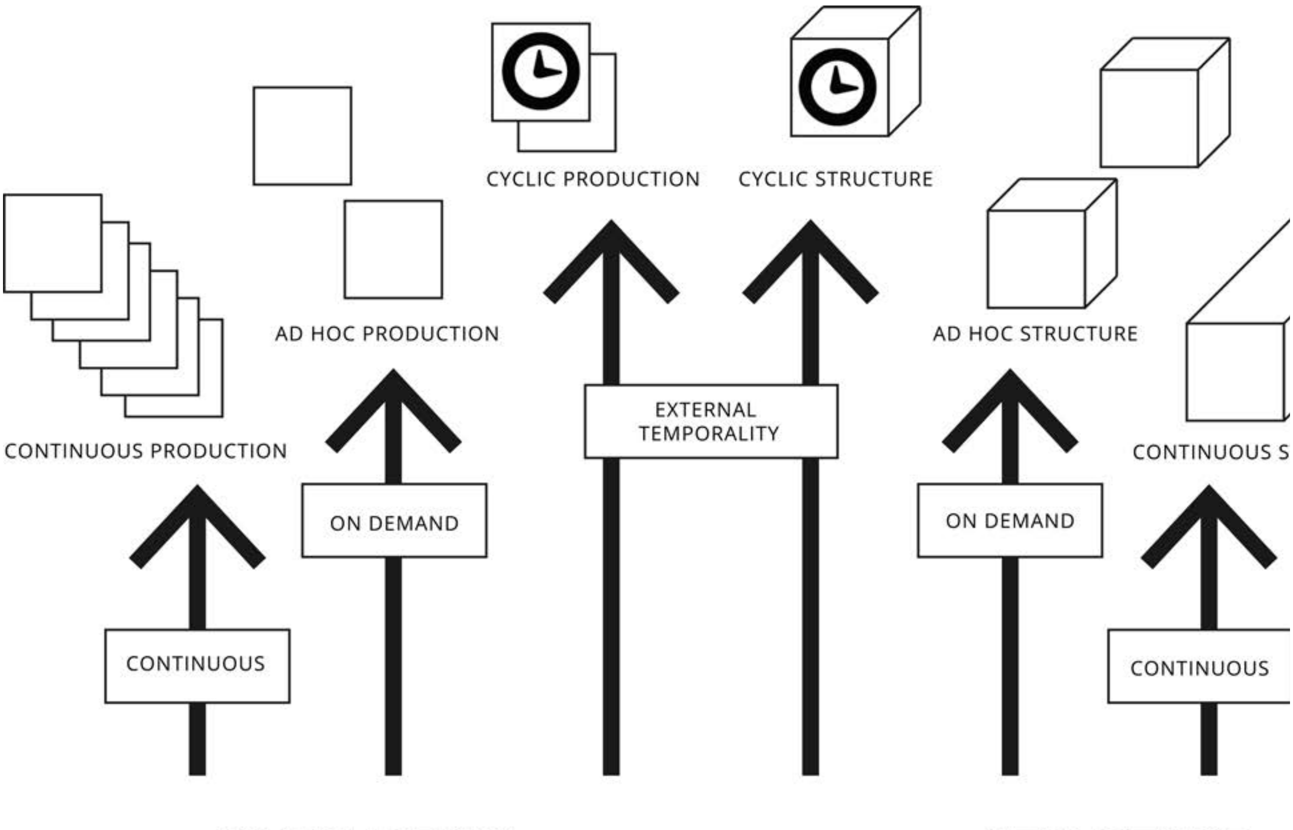

Figure 10. *Production and structure visualization. There are objects that are produced on some time-frame basis. Objects can be produced as individual items on a continuous, on demand, or on some cyclical, basis. Objects that become permanent (Read: continuous) structures within an environment can be produced/sustained continuously, on demand, or on some cyclical basis. Often, individual item objects that are produced via some service are used either used immediately (e.g., fresh food), held in a physical/ digital library/catalogue repository, or held for some later pre-scheduled event in a repository. A repository (library) is a continuous structure.*

1. Local physical habitats as platforms for habitat service operations (processes). The local physical habitats combine into a physical habitat service system network. Herein, the local habitat systems exist because of an informational [resource] base.
2. A global information system about, and for use with, habitats. Herein, the global information system exists because of a physical [resource] base.

2.2.2 Habitat network conditions

The construction of systems in the real-world can be oriented toward specific value states, conditions and objectives. The resolution of decisions in a principled manner ensures social navigation together is possible:

1. **Objective 1: Open by default.**
   A. Use of freely accessible open data has significant contributor (social and economic) value; data should be open and transparent by default, unless there are safety concerns.
      1. Open data improves transparency of decisioning and the community's trust.
2. **Objective 2: Timely and comprehensive.**
   A. Data is valuable only if relevant to its users.
   B. Data should be accessible to its users.
   C. Data should be provided as accurate, comprehensive, and "high" quality (and/or carry a certainty value with linguistic reasoning).
3. **Objective 3: Unified integration of system (comparable and interoperable).**
   A. The potential effectiveness and usefulness of datasets increases with improved quality (integration and certainty), easing comparison within and between similar sets over time, aided by compliance to a common data standards.

2.2.3 Uncertainty

> **INSIGHT:** *Individuals in a community do not necessarily seek to systematizing life or freedom, but instead systematize humankind's support structure so that everyone can live a free and more self-directed life.*

In the real world, when deciding and planning, there will still exist uncertainties as decisions that need arrival at with [some degree of] incomplete information and not enough time. We design systems so that accurate information about all decisioning in the community is available to all people. Economic goods and services ought to fulfill human needs, not pseudo-satisfy them.

> **NOTE:** *All economies, because they involve resources from the real-world, carry uncertainty.*

Any form of system design must have a blueprint to work toward, or the designer(s) are engaging in wishful thinking; and, society is no different. As with all technical plans humanity must have a design apparatus and blueprint or the work is destined to fail.

> *"The major problems of the world are the result of the difference between the way nature works and the way people are conditioned to think."*
> *- adapted from Gregory Bateson*

2.3 Branches of production [service]

Technology is [a] production [platform]; wherein, production may be generally divided into two branches (under market-State conditions):

1. **Production of means of production.** Production of machines and raw materials used to produce the means of consumption. The machines that produce the deliverables are the deliverable
   A. The skills, tools, and resources that produce habitats. Habitats that sustain and duplicated the habitat, as a physical service for human need fulfillment, must be created.
2. **Production of means of consumption** using the means of production, the machines, to produce final user deliverables. Production of consumption goods, finished goods, and finished deliverables. The deliverable is now produced by the machine(s).
   A. Habitats are platforms for serving human need by maintaining life services, producing finished products, which are shareable at the local, regional, and global scale. Habitat teams contribute to the continuous and optimized operation of the habitat as a service to all humanity.
3. **Production of an integrated habitat** [service network] operating to directly meed individuals' human need requirements. A habitat service system network is constructed wherein contribution is integrated with the means of production, integrated with means of consumption, and calculated for what is possible and probable over time. The habitat services are the means by which human need fulfillment services are safely and appropriately met. The means of production is the integrated habitat that acts as a service support platform producing material services and objects for local, regional, and possibly even, global usage. The deliverable and machine that produces it become habitat where common heritage resources are accessed in a coordinated manner by means of team, common, and personal access tags.
   A. Habitats are locally integrated centers of production [of the habitat service support sub-systems]. Integrated habitat service systems are

the primary deliverable.

To produce and sustain community, the two points of production (Read: means of production & consumption) need to be in sync, because the branch of production that produces the means of production has to produce the means of production for itself and for the means of consumption branch. In community, the point of synchronization is the habitat service system network, where resources are shared and habitats are master-planned via working groups.

NOTE: *In concern to production, there are the production plans for the fixed means of production, and there are the production plans for the final deliverables made through the fixed means of production. In community, habitats become the fixed and service-oriented means of production of [human] fulfillment.*

Integrated habitats are planned production environments. Therein, what is produced, may be produced for local, regional, and/or global usage. Technology (cultivation, sector, etc.) production in community may be local, regional, and sometimes, global. The more complex and resource intensive a technology is, the more likely it will be that that technology is produced at a regional scale instead of a local scale. Another example is electrical production, which may be a mix, produced regionally and also, where flows are available (e.g., wind, solar, hydro) partly locally. There are places where people live that are not conducive to producing electricity and places where people do not live that are (e.g., hot places with a lot of sun and windy places with a lot of wind). It is possible to image that one day in the distant future there may be one location on the planet that produces most of the electricity for the whole planet.

2.4 Phased forms of production [service]

The common decision space accounts for three forms of production:

1. **Continuous** (A.k.a.., fixed, constant).
2. **Ad hoc** (A.k.a., on demand, flexible).
3. **Cyclic** (A.k.a., seasonal, periodical, cyclical).

Everything produced with one of these production tags has one of two other tags associated with it: in-production service; or, structure. Something that is structural becomes part of the Habitat Systems Service infrastructure. This integration of a structure into the Habitat systems infrastructure may be temporary (i.e., ad hoc or cyclic) or may be permanent (continuous). A structure is integrated into the infrastructure of the Habitat system for some "serviceable" duration of time. Continuous structures live out their usable / functional lifetime as a fixed component of the infrastructure. Production refers to a good or service being produced in some quantity and not integrated directly into the Habitat system's service infrastructure for any period of time. These are more flexible services. Note, that services always involve some infrastructural component, but the degree is relevant here.

Hence, there are six different production tagged input

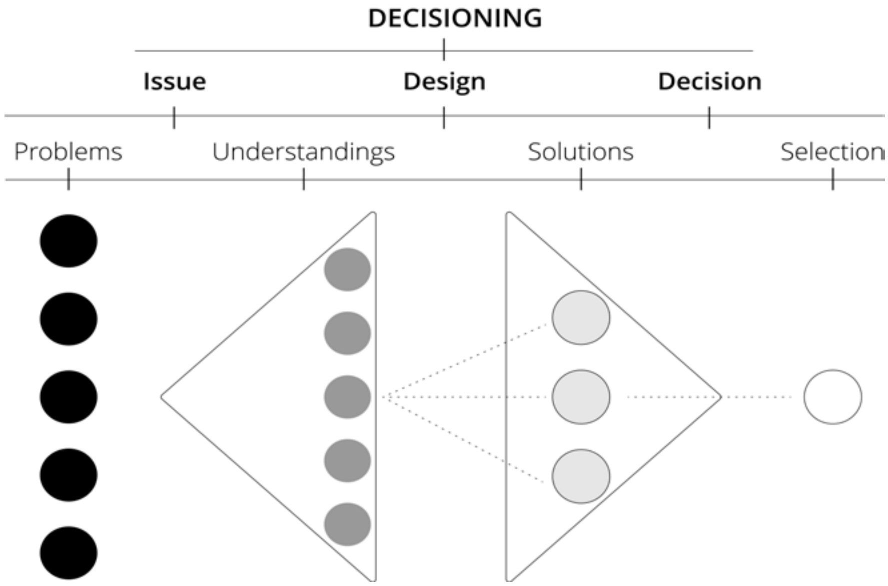

Figure 11. *This is a high-level flow-type chart of a linear process of: being presented with a problem that becomes and issue (on the left), which requires some set of understanding to design a solution (by comparison) in order to determine the finalized and single selection of a solution among those available, which are understood as completely as possible. And then, there is feedback upon whether or not the solution, when acted upon and/or operated resolved the problem as expected. An economy can be formalized and calculated as a matrix of informational (conceptual) and material (numerical) systems. When there is sufficient information to input into (Read: to inform) an open software system, based on a deeper conceptual system, then decisions about the allocation of global resources become possible. When there is sufficient contribution, together with the necessary information, and the necessary accessibility of resources, then global economic planning becomes possible, if not probable. Global economic planning necessitates the acceptance and contribution to a global socio-technical standard of specification and operation. In the early 21st century, there are technical standards accepted to ensure the efficient and inter-operative nature of a technical society. Rights and other political standards and legislation govern, significantly, the social operation and potential adaptation of society.*

units to account for:

1. **Continuous production** – continuously recycled material space; such as food and energy, which are continuously needed and therefore continuously produced and recycled. For instance, a water recycling system is similarly a continuous production.
2. **Continuous structure** – the production of an absolute structure in material space, a building and service infrastructure with a functional space requirement – in other words it is continuously existing, not changing location or function. Continuously stationary.
3. **Cyclic production** – seasonal foods or items that are produced in some cycle and may be inventoried/stored as "input" at an access center.
4. **Cyclic structure** – a temporary cyclic event (e.g., an annual celebration); something that is set up and taken down on a cyclic scheduled basis.
5. **Ad hoc production** – produced on demand; many goods are produced on demand with reserve.
6. **Ad hoc structure** – a temporary event; an incident response event boundary is an example of this; a re-attachable crane is another example. Ad hoc structures generally exist to build, to take down, or to "section off".

The form of production described herein is akin to an on demand catalogued (or application) production system for goods and services. The more thought responsive an economic environment is the more it will naturally come to resemble a customizable catalogue for on-demand production applications. Through technological ephemeralization the tendency is toward a more thought responsive and "on-demand", customized service system. A community can host both a physical library system as well as a digital library "inventory" for on-demand production. A library is a location with a set of products available from an inventory (of products). Libraries can be browsed by someone with a preference for their selection of what to access.

Inventory (digital & material) is assessed through a dynamic and direct feedback link between production, distribution, and demand. Inventory accounting and tracking is an entire area of study unto itself, and it is being done this very day at a globally massive scale. It is an access system, an item can be returned at any time for re-processing through the system.

> **NOTE:** *It is possible to be adapted to variation and variability (e.g., temperature variation and diet variability).*

2.5 Flexibility of production [service]

In a sense, there is a scale of flexibility, from the fixed three-to-five year habitat master planned operation, including services and infrastructural objects, to that of light and flexible production cycles of, generally, personal, but also common, access items (and areas). Some of the provided objects are provided to some planned and preferred cyclical production (assembly-line manufacturing, event hosting), others are produced on-demand (incident response, 3D printing). Architectural-infrastructural installations are themselves objects of the materialization process of construction.

Production for user access may be optimized by classifying production as:

1. **Flexible** (customizable during production cycle) - a production cycle can be tailored (customized) to meet a change in user preference.
2. **Cyclical** (master-planned, then operated, and then re-master planned, ...) - a master-planned production cycle, which involves:
   A. **Habitat production cycle (a.k.a., long-cyclic production events):** The product is a complete and total (integrated) habitat production (a.k.a., total urban planning, total city system, integrated city system).
   B. **Machines production cycle (means of production production cycle; a.k.a., medium-cyclic production events):** The machines that produce the habitat and habitat service-objects are produced in a cycle.
   C. **Goods production cycle (a.k.a., short-cyclic production events):** The products are objects used and consumed by people. Goods (non-fixed, chattel objects).

2.5.1 Classes of production

The following are the categories of possible production:

1. **Light production** (a.k.a., light "means of production") - primarily personal and habitat common-access usage objects. General production of user objects for the usage of teams, common users, and personal users:
   A. Cultivation with light processing prior to production into a service-object.
   B. Assembly-line manufacturing using machines and some degree of automaticity.
   C. Team-cooperative factory (i.e., lab, workshop, etc.) manufacturing.
2. **Medium production** (a.k.a., medium "means of production"; note: sometimes not an identified category; i.e., only light and heavy are the production categories) - refers to the integration of heavy products into:
   A. Major machines.

B. Fixed architectural-infrastructure.

3. **Heavy production** (a.k.a., heavy "means of production") - primarily produces intermediary products, and thus, the products are for InterSystem materialization services. Generally occurs outside of population densities. Heavy production processes include, but may not be limited to: extraction, mining, heavy chemical production, and mono-agriculture. The products are not used directly by end users, but are used by the "means of production" (light and medium production) to produce end products. The primary products of heavy production are minerals and chemicals (for use in medium production of machines and habitat architectural-infrastructure).
    A. **Mining of minerals production** - produces minerals extracted from the surface and sub-surface of the earth. Generally considered heavy production.

2.6 Economic planning [service]

A.k.a., Economic calculation, economic plan, economic sciences, economic decisioning, economic matrix diagrammatic decisioning, mathematical economics, , centralized planning, economic cybernetics, operation research, optimization econometrics, industrial ecology, global resource accounting model.

Every externalized service system has some degree of forethought. Herein, economic planning is a mechanism for calculable allocation of common resources between and within socio-technical organizations to meet user demand directly; and, because it is cooperative and direct, it is held in contrast to the market [price] mechanism for economic calculation. Whereas economic planning can occur within a cooperating structure, the market mechanism specifically occurs within a competing organizational structure. In a planned economy, the allocation of resources is determined by a comprehensive plan of services and production that specifies and probabilistically configures all service entities with the allocation of resources in time. Note that all large corporations [in the market] do central economic planning internally for their own benefit. Many State authorities centrally plan their governments and socialized jurisdictions. Fundamentally, economic planning (is strategic planning) is planning and preparing in advance to respond flexibly and transparently to a range of human need fulfillment requirements.

The Soviet Union performed a type of early economic planning under a project called "Gozplan". Therein, all calculation were done manually and included prices. Gozplan is considered an early form economic planning because it used "the method of material balances", which predates Kantorovitch's work on economic input-output planning from the 1950s-1960s. The method of material balances accounts for a certain amount of output from a given industry, and then, calculates the spread across multiple industries.

Whereas market economists claim that in order to compare different ways of producing things (via outputs & inputs), their optimal method of comparison is the price mechanism (i.e., the items costs in the market where there is trade and competition over supply and demand). Kantorovich showed that if you agree on the mix of outputs, then it is possible to design a structure to arrive at an optimal (or, equally rational/more rational), allocation of resources than the market, using a dimensional matrix of inputs and outputs (a database layout and operational technique) revealing the ratio of inputs to outputs.

A economy can be represented as a network configuration (or "network architecture") of the cycle of resource flows and transformation from source to production to usage, and its return cycle.

> **INSIGHT:** *A total city system approach requires overall planning to attain a higher standard of living for everyone.*

2.6.1 Rational economic decisioning

A.k.a., Rational economic planning, automated economic planning.

At a higher level, an economic system is a decision system. It is a decision system about the transformation of resources into final usages. Rational systems use reason and exhibit universal drives toward self-preservation (self-protection), resource acquisition, replication, adaptation, and efficiency. In other words, rational systems apply [reason-able] safety scaffolding strategies toward their decisioning methods [in order to meet their drives and fulfill their needs]. Herein, a rational plan involves [at least] the conceptions of definition, formulation, implementation, evaluation, and modification (based on feedback).

This economic model may be known as a 'rational economic model'. The rational economic decisioning principally states that if we understand the environment that we are in, then decisioning involves imagining the different actions we might take, visualizing and otherwise simulating the state-dynamic that those actions are going to lead to (i.e., the action space), and then, taking the one that leads to the outcomes that are best for us (and our goal, purpose, or objective). And, if we don't know the environment, then we need to both visualize it and test it out; we need to 'learn'. In other words, this form of decisioning is a systematic way of perceiving forward. This economic system encapsulates this understanding into a series of algorithmic micro-calculations and a set of capability inquires. Also, rational economic decisioning asks two additional questions in order to orient decisions in it environment: What is our goal (intention)? What do we have to do to fulfill our goal (task)?

An efficient economy is the creation of a system and then an optimization within the system until a new system replaces it. Remember, efficiency needs direction: we can optimize for profit or for fulfillment, which are contradictory [structural] directions. And, how many tiers of profit extraction and monetary making is there in your society?

"Failure to plan, is planning for failure" is an absolute misquote of the original quote, which is, "We don't plan to fail, we just fail to plan." The two are poles apart in meaning. A failure to plan cannot be a plan for failure, because every plan is built to achieve an objective. Failure cannot be an objective for a rational person, unless that failure is some kind of ulterior way to gain a larger objective. For example, an unscrupulous person may deliberately sabotage a meeting in order to gain importance (you people couldn't achieve the objective through a meeting, but I achieved it my own way). In normal circumstances failure is not an objective, and therefore, there cannot be any plan for it (unless the failure was intentional). When we see the original quote, we see the significance of the way it is phrased. It implies that failing to plan leads to failure. However, in the misquoted version, there is an implication that failing to plan is a deliberate, mapped out effort to fail. This, as any rational person can testify, is simply not so.

> **INSIGHT:** *The more prepared we are, the greater our potential to accelerate our personal growth and navigate a responsive environment.*

2.6.2 Logistics

A.k.a., Logistical economics, transport logistics.

Logistics refers to the wide set of activities dedicated to the transportation and distribution of products, such as the material supply of production, as well as related information flows. From the perspective of discovery, logistics is the science of moving an object(s) from one location to another in the most efficient, effective and optimal way (known). The kinds of problems that concern getting an object from one location to another most efficiently are known as optimization problems.

Logistical activities are grouped into three major functions:

1. How to best create and move objects through a transportation network? The physical moving distribution of objects via transportation pathways to end users and/or storage (etc.).
   A. The physical occupation of existing locatable space by some object under transport.
2. Informational coordination of materialization, including physical production, transportation, consumption, and re-cycling. (a.k.a., materials coordination, materials management).

Physical distribution is the collective term for the set of activities involved in the movement of products from points of production to final usage. Materialization considers all the activities related to the production of products in all their stages of production along a supply chain.

Depending upon its specific application the term logistics has a variety of related definitions. Herein, logistics refers to the flow and storage (i.e., inventorying) of goods, services, and related information (i.e., material service information) between the point of origin and the point of destination in order to meet user requirements. Logistical processes involve information, communication, and transportation systems. It is essentially the planning and carrying out of the movement of resources to, and sometimes through, a system. In other words, logistics is the process of identifying the optimal means by which to move material service information - information which has entered the presence of the material service system. There are two logistical service systems: communications (digital service information) and trans-distribution (transportation and distribution - material service information). Logistical processes control the movement and direction of matter and electromagnetic flow. These two physical service flows move matter and energy within the unified, materializing information field. In the material system these service flows form a coordinated network of pathways, conduits and technologies for the movement of information (e.g., humans, electricity, data, and objects) within the field.

2.7 Lifespan [service]

All dynamic systems have lives, no system is eternal. All systems have lives because all systems have internal contradiction and over time they move off from equilibrium, and when they move far enough from equilibrium they begin to oscillate. The oscillation becomes so great that it causes the system to destabilize into what in the science of complexity is known as a "bifurcation". The system does not survive, but where it will go is uncertain because there are two alternative possibilities. Either the system can be born again with a new model, a model that makes the old model obsolete, or the system can be left to its collapse and eventual decay.

Aging (or 'senescence') is an intrinsic side effect of the normal operation of a material body (or technological good / service) due to the presence of entropy in the system. The normal operation of a material system generates side effects, generates damage, molecular and cellular (in living systems) causing changes to the structure and composition. Those changes accumulate over time and throughout the life of the system; they are generated as a side effect of even simple operations that are non-negotiable to the system. The operational life of a material system is known as its 'lifespan'. Lifespan is multi-factorial (i.e., there are multiples of factors that influence lifespan).

Aging is possibly inevitable in a material system, regardless of extropy (i.e., the replacement of parts). There is, however, a minimum rate at which these changes can occur. What is not inevitable is that such damage should remain unrepaired. We can intervene and provide an external influence to facilitate a longer lifespan of the system. For example, medicine is supposed to be about restoring health to a living biological system. The essence of medicine is the facilitation of restorative mechanisms as well as repair to the ongoing and accumulating molecular and cellular damage in the human body system, and thereby, keep it below a level that causes disease, disability, and malfunction.

Some systems are set up to tolerate a certain amount of damage, and it is only when the damage accumulates beyond a certain threshold that things start to go wrong. Hence, medicine may not only be restorative, but it may also be preventative (i.e., preventative maintenance that prevents damage before it builds up) -- periodic preventative maintenance.

> **CLARIFICATION:** *Lifespan is generally discussed in terms of "protected conditions of operation" and "normal environmental conditions of operation".*

In some sense, it could be said that the "'homeodynamic space" of a system determines its lifespan, and that the homeodynamic space shrinks as the system ages, becoming lesser over time. It becomes more prone to "things going wrong" over time and with age. Herein, aging is the shrinkage of the homeodynamic space which makes the system more prone to the diseases of age (in humans) associated with the system under observation. In designing a system we must ask ourselves, What is the most fundamental reason for shrinkage of the homeodynamic space? It is the occurrence and accumulation of molecular damage. Imperfect maintenance and repair systems allow the accumulation of molecular damage, including damage in the repair systems themselves.

Also, life can export entropy. We can remove entropy as a mechanic would repair a part of a car to keep it going. At times, functioning can be maintained and restored through replacement.

2.8 Life-cycle assessment [service]

> *A.k.a., Life cycle analysis, cradle-to-grave analysis, or more recently cradle-to-cradle analysis, environmental impact analysis.*

All systems have a life cycle. Life cycle assessment (LCA) is a systematic technique for the analysis the environmental impacts associated with all the stages of a life-cycle of a product systems from a "cradle-to-grave" perspective. Note that a life-cycle analysis can also be conducted from a cradle-to-cradle perspective. Life cycle assessment is a measurement, planning, and decision tool. LCA is focused on studying the whole product system, including the complete chain of production over the lifetime of the product system. A product system can be broadly defined as the network of processes or activities needed to deliver a product (or service) to an end user. Life cycle assessment seeks an objective and rational evaluation of the environmental impacts of a product system. Life cycle assessment is similar to input-output modeling and has related computational aspects. (Tan et al., 2018:91)

There are several forms of life-cycle analysis, each of which is related to resource positioning:

1. Cradle-to-grave is the full life cycle assessment from resource extraction ('cradle') to the use phase and disposal phase ('grave') of the product's resource composition.
2. Cradle-to-gate is an assessment of a partial product life cycle from resource extraction (cradle) to the production output gate (i.e., before it is transported to the user).
3. Cradle-to-cradle is a specific kind of cradle-to-grave assessment, where the end-of-life disposal step for the product (as a composition of resources) is a recycling process.

In a life cycle analysis, each product system is analyzed by tracing all upstream process chains to their ultimate sources (i.e., extraction of resources from the natural environment) and likewise by tracing all downstream process chains to their final destinations. In principle, the analysis should encompass the entire life cycle of the product and its resources. Analysis is also done on the basis of a predefined unit of output of a product system, known as the functional unit. The functional unit represents a specific unit something, such as service (or value delivered; e.g., life, technology, or exploratory) and/or physical quantity (e.g., measured in mass or energy units). The functional unit allows proper benchmarking in cases where LCA results are used for comparison of alternatives. (Tan et al., 2018:92)

Thus, LCA naturally necessitates a quantitative approach, analogous to input-output modeling. The four components of LCA as outlined in the ISO 14040 and ISO 14044 standards are (Matthias et al., 2006):

1. Goal and scope definition - Identification of purpose, system boundaries, functional unit, technological assumptions, the natural resources, pollutants and environmental impacts of interest, data sources, and other relevant assumptions.
2. Life cycle inventory analysis (LCI) - Estimation of flows of natural resources into and pollutants from the product system per functional unit.
3. Life cycle impact assessment (LCIA) - Estimation of environmental impacts of the product system per functional unit.

4. Interpretation - Use of information derived from previous steps to address the purpose of the LCA and to determine whether or not the results are sufficiently conclusive given the errors and uncertainties that occur in the analysis.

2.8.1 Product life-cycle lifespan

There are two general life-spans for products in an economy (for meeting the final needs of end-users):

1. **The maintenance lifespan:** Objects that are to be used repeatedly by the same person or different people (Read: repeated use), and may need some maintenance for their nominal operating status to be maintained. In a habitat, there will be personal-access, common-access, and team-access technologies with maintenance lifespans.
2. **The sustainable single-use lifespan:** Objects that are to be used one-time, collected, and refurbished or cycled. In any society there will be objects that are used one-time, and then, refurbished (e.g., sterilizing) or cycled (e.g., melting and reforming, or composting). Here, a product is used once, and then its resources are collected and used for the same purpose, or are re-purposed. Here, waste streams become the source of raw materials (a.k.a., circular economy, doughnut economy, etc,).
3. **The wasted single-use lifespan:** Objects that are to be produced, used once, then wasted into a landfill (i.e., having a single-use lifespan). A significant amount of trash is generated by people's processes in disposing of end-use materials from their homes, such as cardboard, paper, building and packaging materials, expired items, plastic, etc. Here, the resources, after use, are either (1) a pollutant in the environment or are (2) placed in a landfill of mixed wasted products. A single-use economy is a problem for resource sustainability. Single-use plastics are particularly problematic due to their non-biodegradable nature and their significant contribution to environmental pollution, including landfills and ocean waste. These materials, designed for temporary utility, persistent in the biosphere for centuries, exacerbate waste challenges and posing serious threats to wildlife and ecosystems.

2.9 Societal sustainability [service]

The earth is a semi-closed system. The earth is closed to the flows of material input and output, but open to the flows of energy (and work). Note that in general, the only cosmic input is solar energy, and the earth's only cosmic output is heat. Herein arises a general problem for human health and reproduction, all of the resource materials needed by human society must be obtained from a finite, non-renewable supply within the earth boundary as a supra-system, without denying other necessary earth sub-systems access to those resources. Similarly, the outputs from human society must be absorbed by other societal and ecological sub-systems so as not to become sequestered as unusable waste or worse, toxic to other subsystems. (Mobus, 2017:545-546)

The human societal system (i.e., social, decision, lifestyle, and material systems) is a sub-system of a whole environmental earth-hominid system (e.g., the Real World Community Model). Sub-systems of a semi-closed supra-system must fulfil a 'purpose' in the context of the larger [societal] supra-system in order for the system to remain efficient, and ultimately, sustainable. The success of a system in interacting with its environment over an extended timeframe depends on that system's ability to regulate its activities, both internal and external so as to remain effective and adaptive, which are necessary conditions for its sustained continuance. Whereas an effective system is a system that meets its purpose (or function), an adaptive system is capable of modifying its behaviour in order to accommodate some variation in environmental conditions that places the entity under stress. (Mobus, 2015:6) The roles of effectivity and adaptivity, and the mechanisms of a cybernetic control subsystem ("governance") in maintaining these, are the means for achieving sustainability in all types of complex societal systems. (Mobus, 2017)

In order to regulate activities, a system/entity may apply principles associated with control and coordination ("governance") within its decisioning process. Therein, a priority-based (adaptive) and hierarchical-based (veridical) cybernetic societal system (PCSS and HCSS) provides the potential for (Mobus, 2017):

1. The internal regulation of subsystem interactions (*operations*).
2. Coordination of a subsystem of interest with other subsystems in the [societal] supra-system (*operations*).
3. The design of subsystems (*development*).
4. The potential for strategic evolution of the whole societal system in anticipation of future changes (*development*).

Mobus (2015) argues that a hierarchical cybernetic decision system (HCDS), when properly architected and constructed, and working with veridical decision agents [with sufficient decision models], is how natural systems such as cells and higher organisms (including eusocial colonies) persist over evolutionary time.

Mobus (2015, 2016, 2017) uses the acronym HCGS instead of HCDS - hierarchical cybernetic governance system (HCGS) versus hierarchical cybernetic decision system (HCDS). The societal system described herein seeks to remove and replace the conception of "governance" as much as possible, since it carries market-State connotations that do not apply under a community-type societal system. When Mobus (2015:4) uses the term 'governance', he means 'hierarchical cybernetics'. Since a cybernetic system is a combination of a controlled dynamic system and a control system (Parin et al., 1966), the term 'decision' is used herein in place of 'governance'. Alternatively, it may be possible to refer to the system as a hierarchical cybernetic control system (HCCS) or hierarchical cybernetic societal system (HCSS).

The decision system herein is both adaptive (PCSS) and veridical (HCSS). Veridical decisioning is based on the identification of a correct response, which is intrinsic to the external situation and may be subject-independent (a.k.a., actor-independent). Adaptive decisioning is subject-centered (a.k.a., actor-centered) and is guided by the subject's (actor or actors') priorities. (Goldberg et al., 1999:364) Within the decision system for a community-type society, the Value Inquiries processes represent adaptive [priority] decisioning, and the Solution Inquiry process represents veridical decisioning. A whole decision system for a complex and adaptive societal system must account for both guiding priorities and the optimal selection of the next solution iteration of the state of the society (and its services).

For a complex socio-technical society, a designed and appropriately informed cybernetic societal system (CSS) is a prerequisite for achieving adaptability, resilience, and [individual human] fulfillment, which are the necessary capabilities of societal systems that seek a sustained existence.

All designed control systems have a purpose. Systems designed with a purpose are sometimes called purposive systems; they are goal-oriented. The term 'purposive' signifies that the system actively seeks a goal that will provide it with some kind of completion, reward, or fulfillment, which gives rise to the concept of a social fulfillment (completion or reward) function. The market, and competitive/hierarchical societal systems in general, incentivize by rewarding with an abstraction, 'money'. In a community-type society, the result of fulfillment/completion is 'access', directly.

All truly purposive systems obtain resources (e.g., material and energy) from sources in the supra-system. These systems do real work using energy to transform materials for their own internal use, and they output products to other systems and wastes to sinks. Mobus (2017:3) states, "A purposive complex adaptive and evolvable system produces outputs that are acceptable to environmental sinks." Therein, growth potential is ultimately a function of availability of resources and the capacity for waste sinks to absorb and nullify wastes. In addition, systems produce outputs that fit the criteria of acceptance by environmental entities by virtue of their structures and functions arrived at by either evolution or design. Such systems are capable of recovering from disturbances within limits. (Mobus, 2016)

A properly functioning sustainable societal system provides [at least] three capabilities:

1. Adaptable to environmental changes.
2. Resilience for maintaining functionality despite such changes, and repair when those stresses are extreme.
3. Effective fulfillment of each sub-system's purpose to provide requisite functionality.

Sustainability is sometimes defined through a developmental viewpoint:

> *Sustainable development is the kind of development that meets the needs of the present without compromising the ability of future generations to meet their own needs.*

This definition contains within it two key concepts:

1. The concept of 'needs' (requirements for life); and
2. The conception of 'limitations' (constraints for living).

Although useful for societal service subsystems, this definition fails to address the necessary conditions that would have to be met for the persistence of a societal system as a whole; that is, what would be needed for humanity to say the societal system is currently sustainable as a whole.

Mobus (2017) provides an working definition of sustainability of all complex systems:

> *A system persists in structural, functional, and purposive conditions into an indefinite future. Sustainable processes are those that can continue into an indefinite future.*

Then, Mobus (2017) describes the necessary conditions for the sustainability of all complex systems -- a system persists by meeting the following set of necessary conditions:

1. **Fulfil a purpose** - produce valuable outputs.
   A. All material flows in a semi-closed system must by cyclical (Daly, 1996). There can be no build-up of waste materials or the exporting of materials that would be toxic to other subsystems. For a sub-system to serve its purpose, its outputs should be useful to other subsystems. They should be produced at a rate commensurate with that at which the other subsystems can absorb and use them. Every subsystem within a supra-system has co-evolved to provide some other subsystems with products or services that contribute to the sustaining of those recipient subsystems. The subsystem can accomplish this function only if it can maintain its own sub-processes in working order. It must

have internal regulatory functions that detect deviations from normal working and correct them as quickly as possible. It must be able to repair itself using some of the inputs.

2. **Receive inputs** - to produce and to know what to produce.
   A. The subsystem must be able to obtain all the resources it needs to: (1) maintain itself, and (2) produce the desired outputs to the rest of the supra-system (i.e. fulfil its purpose). Because the resources it needs are actually outputs from other subsystems and those subsystems can only produce those resources at rates determined by the mass balance of the whole system, the subsystem is constrained to obtain such resources at the 'natural' rates at which they are made available. A condition 2 corollary is that in order to ensure stable fulfilment of purpose, the subsystem must have a capacity to measure those rates and adjust its internal rates of usage in accordance. Subsystems must 'measure' the efficacy of their inputs and that of their outputs (relative to the absorption capacity of the sinks with which they are coupled) and regulate their activities accordingly
3. **Be adaptable** - The subsystem must be adaptive within the ranges of variation in extant conditions in the larger supra-system.
4. **Be evolvable** - A complex adaptive and evolvable system (CAES) subsystems are, over the long run, challenged to undergo evolutionary changes (Mobus, 2015) to adjust their workings to the changed needs. This may mean a simple readjustment of the norms and ranges of their adaptive capacities (e.g. the predator evolves faster running capacity in response to faster prey). Or it may mean creating new internal capacities to obtain substitute (or better) resources or produce new goods and services (i.e., in the market, products or services for new 'customers').

If these four conditions are met, any subsystem should be sustainable indefinitely, until one of the conditions is not met. These four conditions can be derived from Miller's Living Systems Theory (1978), that is, subsystems identified by Miller work to provide the processes that produce these conditions. (Mobus, 2017)

2.10 Self-organizing systems

> **MAXIM:** *A system behaves in accordance with its [designed] nature.*

From an engineering perspective the design of a self-organizing (self-directing) system is generally viewed as comprising two different phases:

1. First, the behavior of the system must be described as the result of interactions among individual behaviors, and then
2. The individual behaviors must be encoded into controllers.

Both phases are complex because they attempt to decompose a process (the global behavior or the individual one) that emerges from a dynamical interaction among its subcomponents (interactions among individuals or between individual actions and environment). In other words, a self-organizing systems decisioning process must be made explicit if global and individual behavior is to be understood and re-oriented toward greater fulfillment and well-being.

Since individual behavior is the result of the interaction between agent and environment, in an incompletely modeled (or inaccurately simulated) system it is difficult to predict which behavior results from a given set of rules, and which are the rules that will create a given behavior. Wherein, difficulties will occur in the decomposition of the organized behavior of the whole system into interactions among individual behaviors of the system components. Here, the understanding of the mechanisms that lead to the emergence of self-organization must take into account the dynamic interactions among individual components in the system and between components and environment. Given a set of individual behaviors in an obfuscated system it will be difficult to predict which behavior at the system level will emerge, and it is also difficult to decompose the emergence of a desired global behavior in simple interactions among individuals (i.e., the appearance of "irrationality"). In addition, the role of the environment in relation to the emergence of the global pattern should not be neglected in design.

2.10.1 Swarm resiliency protocols

> **INSIGHT:** *The ultimate purpose of intelligence is to ensure the survival of its carrier.*

In some ways, the strategic protocols described by a global production and distribution service architecture could be referred to as 'swarm resiliency protocols', for they are designed in an emergent manner to re-create an adaptive consensual information model for coordinating decisions across the network of our community. Herein, they are designed to avoid socio-economic instability, and to intentionally iterate toward access fulfillment and resource abundance at scale (through cooperation). This behavior is known in the literature as 'swarm intelligence' - this decisioning system is a distributed access systems, which behaves with social-swarm intelligence.

The ultimate arbiter of swarm protocols (as socially-coordinated decisions) is the community itself, in which a multitude of decisions lead to the acceptance or rejection of any particular protocol. Herein, the acceptance of a protocol as a 'standard' is something that occurs independently of "formal endorsement" by a "standards body". Herein, a protocol becomes accepted as a 'standard' through its codification and actual use. Regardless, the ultimate test of a protocol is whether or not it becomes widely accepted and implemented in the community [by the individuals and teams who use it to provide for their own fulfillment].

What do protocols do if not structurally transform potential in a routine manner. With the structural transformation of potential comes a decision space (i.e., "choice" in how to orient our structures). We have the "choice" to transform our world into one of fulfillment and greater meaning through the way in which we understand our responses and commonly direct our movements.

In a system, 'intelligence' might mean how efficiently the system is capable of controlling for feedback in a given situation. 'Negative feedback' (a systems term) provides a 'value space' to direct the orientation of a response in a desired manner (i.e., 'control'). A system might use a 'control protocol' to set boundaries around the transformation of particular information set, which may be a material resource. A very straightforward example might be the following: a loving parent wouldn't give a 5 year old a loaded pistol to play with. This is a very simple protocol. When a pistol enters the information space of someone untrained or incapable of using it safely, then turning it over to an untrained user would increase the probability of death and or suffering. Hence, a healthy structuring of behavior (i.e., socially intelligent coordination) would dictate not giving the gun to the untrained user, particularly a child who may not even understand the concept of a 'weapon'. This 'protocol', as a restriction of material access, is not equivalent to 'secrecy', which involves the permissive denial of access to information.

Remember, an individual's value orientation is important here. Someone with the type of value orientation standard in early 21st century society would not function well in a swarm intelligence system until s/he adapted to the "functioning of the swarm".

2.10.2 Open protocol revisioning

Protocols are usually not static, but instead typically undergo revision and enhancement in response to experience and/or changing community requirements. In some cases, continued development and enhancement of a protocol is accomplished by means of an interdisciplinary team, other times the protocol might be enhanced by an individual seeking to understand and solve a problem elsewhere in the system [that happens to interrelate at a deeper level with a pre-existing protocol].

Participatively adaptive protocol development and its application within a swarm-intelligence economic network may be described as a "coordinated egalitarian strategy" to common human well-being and fulfillment.

By making the protocol development and modification processes available to all, then all users are on an "equal footing". The application (or "success") of any protocol can then be determined on the basis of its own merits, not on its origin or an artificial endorsement. Herein, protocols are decoupled from artificial social constructs and re-coupled to that which it is possible for us to all commonly experience existence of, the real world. The frameworked structure by which protocols are developed must be responsive to its environment (to us and to our redesigns for ourselves and our fulfillment in a common ecology).

In a decentralized-distributed emergent system the system's network protocols change when those in the network agree to use a different protocol (or version of the protocol). The blockchain technology behind the Bitcoin ledger, for example, can be updated as long as the participants in the network agree; this is known as a "hard fork" to the protocol.

Due to the transparent and open design of the Community's structure everyone can audit everything someone does to the structure of the habitat service system itself. Hence, accountability is structurally reinforced and the incentive to harm the system is reduced.

2.10.3 Decisioning protocols

Decision protocols resolve decisions about the transformative flow of information in the form of a resource. If we don't carefully design our protocols we are unlikely to optimally align with fulfillment. If we don't align our designs they are likely to re-transform us. For example, if we build a bridge poorly that bridge might collapse and hurt us. Maybe we begin to ask ourselves what we are doing to ourselves when we re-encode the idea that competition is a necessity. We design things so they don't unintentionally hurt us (either physically or our overall well-being).

The protocol isn't there to tell anyone what to do; instead, it transforms information in the way we design and verify it to transform the information. A protocol isn't a test from authority. It is an optimized way of doing something. We can now commonly create and iteratively adapt ourselves for the fulfillment of everyone.

A protocol is an access routine, and it is analogous to an individual's daily routine. A 'daily routine' is a series of behavioral events performed in or around the same way on a daily basis. Whereupon, a 'protocol' is a set of information transformers, and expressed behaviors, that are performed in the same manner on a routine basis.

2.10.4 Collaborative protocols

In nature, there are laws (or technical regulations) that in a very real way restrict our behavior in this environment. Hence, there is a need to design our decision spaces and our habitat [through protocols] in such a way that they account for these natural laws (if we are to maintain sustainable fulfillment in the community). To maintain our community we have to be sustainable and efficient, and therefore, we have to follow some set of coordinating [technical] rules (a.k.a. protocols) in the iterative design of our habitat. Fundamentally, collaboratively developed protocols are necessary to maintain the coordinated integrity of the Community.

Protocols anticipate and automatically focus computational attention [toward an outcome]. In community, protocols are cooperatively and transparently formalized toward an explicitly intended "outcome". Herein, collaboration reduces the possibility of human error (and bias). Collaboration facilitates the emergence of a commonly intended system wherein the very idea of "negligence" would seem odd. Why would someone even be "negligent" in a resource-based economy? If negligence means to be inefficient on purpose, to be "lazy" (in the pejorative), then how does this state of being arise from contributors and participators who have no drive or desire to be wasteful on purpose. The difference is [partly] in the environmental signaling. Herein, designs that are not "feasible" (i.e., do not align with the design protocol) are rejected by the formalized calculation system [with accompanying reasons, suggestions, and substitutions]. Designs are feasibly confirmed before their transport acceptance is processed.

So, in part, decisioning is the standardization of protocols that allows the system to be functional and abundant without micro management oversight (Read: with automation) and to be strong/adaptive (i.e., resilient) in the face of stressors.

In order to understand a resource-based economy one must first have begun to adopt and actualize a valued approach that recognizes the benefit of systems distributed thinking and formalized computation. Also, one must have begun to experience compassion as well as a realization that one's constructions are not the center of everyone's universe. Herein, the computation reads the total environment and arrives at an according adjustment to the habitat service system, which may or may not involve the additional exertion of human effort.

> **NOTE:** *Thought responsive environments exist along a spectrum. Advancements in technology essentially allow us to localize the material production of our thoughts to our place of focus more quickly in delta(t) - we can kill with quicker focus or we can fulfill with quicker focus. Over time, the re-tooled development of technology generates a highly thought-responsive material-like environment. An environment where you think something and you can have that thing manifest. The question then becomes, how is this materialization technology oriented and how is it corrected for feedback by the social system? It is correcting for feedback isn't it? A highly thought responsive environment that doesn't correct for feedback cannot focus its adaptations toward a more fulfilling design.*

Our systems are:

1. Systems that work with us rather than against [our] nature.
2. Systems that promote harmony.
3. Systems that facilitate the correction of our distortions.

We are designing a system to:

1. Maximize our freedom of thought of inquiry of fulfillment
2. Maximize the effective fulfillment of our needs and intentions
3. Maximize the efficient fulfillment of our needs and intentions
4. Do so in a discoverable universe
5. Do so in a discovered environment
6. Do so in an emergent habitat
7. Do so in service to ourself
8. Do so in service to our community
9. Do so in service to our unity

2.10.5 Traceability protocols

One of the responsibilities of an "enterprise architectural system" is to provide complete traceability from requirements analysis and design artefacts, through to implementation and the recycling of project iterations. The term, 'traceable', is an adjective that refers to the verifiable trace of a signal signature in an environment. Wikipedia states that, "The formal definition of traceability is the ability to chronologically interrelate uniquely identifiable entities in a way that is verifiable."

The easiest way to understand the idea of traceability is to see a visual depiction of it. *There may be different possible views when tracing information, such as,* **forward traceability** for a diagrammatic visualization of traceability in the planning of a design based upon a change of requirement; **layered traceability** for a visual representation of traceability throughout the habitat information systems architecture; **lateral traceability** depicts the traceability of resources throughout a commonly coordinated 'access space.

A structure that facilitates tracing is likely to optimize performance and accountability at every scale. At the scale of interdisciplinary teamwork, individuals maintain accountability by completing work under the publication of their public [cryptographic] key in association with their individual social profile of skills and past project efforts.

Principally, the potential for traceability leads to the potential for accountability of individuals in their modification of the architecture of the community habitat-system.

2.10.5.1 The GitHub example

A key concept within Git is the "pull" request, in which a developer formally asks for some code that they have been working on to be integrated into another branch within a pre-existing, organizational-level code base. A Git pull request provides an opportunity for team members to collaborate and discuss before reaching consensus on whether the new code should be added to the application (or standard). Git also stores older versions of code, which makes it easy to fall back to the last good version if something goes wrong, and lets you quickly see what's changed between revisions.

The necessity for a set of coordinated operations overseeing the integration of pull requests, involves (Git and GitOps):

1. **Observability:** The operational system offer monitoring, logging, tracking, and visualization into complex applications so developers can see what's breaking and where.
2. **Version control and change management:** Obviously this is a key benefit of using a version control system like Git. Flawed updates can be easily rolled back.
3. **Productivity:** Developers can make constant small improvements to their codebase, rather than rolling out huge, monolithic new versions every few months or years. The continuous deployment piece is made possible by automated systems called pipelines that build, test, and deploy the new code to production.
4. **Auditing:** Thanks to Git, every action can be traced to a specific commit, making it easy to track down the cause of errors.

Github is an application service for [software] project development. And, it represents the encoding of "traceability" at the [software] project development level. Users of github have profiles that account (or trace) their actions and behaviors, while accounting for reputation commenting (i.e., the potential for anonymous criticism) by social others. A user's github account shows how many 'commits' (Read: commitments) have been made [to projects], how many projects have been developed, how impactful they were and "you" were. A github profile provides precisely the type of information a community requires about ongoing human effort into the community itself. The application service 'Stackoverflow" represents a similar project coordination traceability system. Many technology companies are already basing their hiring and employment positions on github (and other similar) profiles. Github represents the potential for an active collaboration process.

Github works off of the idea that through the potential for an open social reputation there is a higher potential for intentional accountability, and hence, a higher degree of trust in the overall system. It is hard to get a good rating on github and it is also very difficult to make someone else get a bad rating. Herein, developing a "positive" reputation doesn't happen through influencing others or bribing them, but it is acquired through actual useful work, recognized by multiple others.

It is hard to fake a good github rating. And, in a participative environment, what incentive would someone have to do so?

In a learning community, individuals can gain an even higher "reputation" by mentoring or otherwise facilitating the sharing of design developments and new understandings. The purpose of a learning community is [in part] to facilitate sharing, is it not? If sharing is to exist then it is useful to structure sharing at every level of possibility from the private person-to-person to individual-to-"social network".

Github is also a form of distributed version control with two big difference with traditional version control systems. First, everybody who works on a project has access to all of the source code all of the time. Git's second big function is that every time a programmer uses git to make any important change, Git creates a signature as a unique universal identifier tied to every single change, but without any centralized coordination, or at least that is the potential. It is a general form of distributed networking.

Github is the manifestation of the social interrelationships of individuals whom are choosing to participate in projects together through which they gain "reputation", which is visible to the community. It is a system that allows for the potential of cooperating socially at scale toward purposeful and usefully-driven work.

3 An access-based economic [decisioning] model

CLARIFICATION: *The decision system is based on access to [habitat] services; it is based on the usage of habitat services and objects.*

The [economic] decision system described herein may be characterized as an access-based model whose functional purpose is to facilitate strategic and shared access to economic services through intentional and integrated design, rather than ownership of economic inputs, processes, and outputs. Herein, 'strategic access' (or 'strategically designed access') refers to the free and equitable access of a population to economic services (or resources) on an as needed or used basis (Read: on an *access* and *use[-time]* basis) through coordinated information and resource sharing with consideration given to future availability (Read: strategic future access and natural service regeneration). Access-based models are sometimes also known as use-base models.

All societal-based platforms must account for access. Access is necessary and two dimensional concept. Firstly, there is access to a team or working group through a contribution-based structure, and then, there is access to goods and service (without force of trade). Access can be accounted for through many types of surveys including demand surveys, contribution surveys, etc. In the market, access is considered through the cost of a sale. In the State, access is acquired through authority. Humans require, for their survival and thriving, access to objects and information, which are produced via services. In a market, access is controlled by price. Therein, the concept of "free access" is mixed with "rights" (given by authority) and "property" (purchased in the market). In a community-type society, access refers to demands and other issues for service that are accessible to users. Ultimately, the goal is to have access to that which optimally meets user requirements (human needs) given that which is available at the time of access. In a community-type society, access centers and integrated transportation systems distribute products. Services are integrated, often modularly, into the infrastructure of the environment in order to optimize efficiency and produce a higher quality experience of access [to services] by a user. With sufficient technical knowledge and ability it is possible to apply automation technologies to increase the efficiency by which access occurs. Automation technologies can free individuals for access to opportunities they might otherwise not have had. Automation technologies can also make access to services, such as medical and informational more safe, reliable, and faster. A decision that optimizes habitat services for human need fulfilment, locally and globally, is what is required.

This "shared" access-based model is the product of a rational value system; in particular, a value system that acknowledges the potential for intentional adaptation and cooperatively integrated design. Fundamentally, the survival of individuals is only limited by their [enabled] *access* to life-serving and life-fulfilling necessities. Similarly, the ability to learn (and adapt) is only limited by a learner's *access* to learnable content, learning materials, and learning experiences. Therein, if all of a community's life support needs are met and individuals are pursuing their highest potential direction, then what they require is not ownership, but access to those items that enable creative and desirable life-learning experiences. When humans have access to the necessities of life, and have adopted a rational and systematically relational value system, then the possibility for an intentionally adaptive common[unity] space opens. Basically, there is no need to "control people" or apply force against the individual (e.g., legislative law) in a society designed to adapt to the fulfillment of everyone's' needs through access-oriented design.

The access model described here is divided into three interrelated subsections:

1. A discussion of 'common heritage' from which a pool of resources originates.
2. The logistical movement and repositioning (or reorganization) of the resources themselves.
3. The utilization of resources by needed services.

This section further details why 'access' has been chosen over 'property', and then describes the foundational structure of the socio-economic model as viewed from an access perspective.

An access-based system might be referred to as a process management system (a.k.a., process coordination system). "What's in charge" is the participatively formalized system itself, not people or subjective whim. What provides access is the process, with the assistance of humans and other technical systems.

It is possible to identify three types of goals/objectives of logistical measurement:

1. **Local availability (local access)** - Local availability is defined as whether or not access is available at the trip origin or destination, or within a city. This refers to the actual availability of an object within a city.
2. **Network availability (network access)** - Network availability is defined as whether or not access is available between origin and destination, or between cities. This refers to the actual availability of an object within a city network.
3. **Comfort and convenience (customization and preferential-type access**) - The avail-ability/access-ability to edit and customize with the certain confidence of not violating others access during or after the process. This refers to subject-taken

actions that do not violate others access.

These three types of measurement goals/objectives are the most relevant to operational performance from a users perspective:

1. Can it be acquired?
2. When can it be acquired?
3. Once acquired, how can it be changed?

Both local and network availability may refer to spatial availability (wherein, a transit service is used to move objects for service access) or temporal availability (i.e., how often, and for how long is the transit service used), or both.

3.1 Common heritage

> **INSIGHT:** *Resource sharing is required to stop economic hierarchy, to prevent individual distortion, and to phase out social pathology.*

This access-based economic model views all resources as the common heritage of the whole of the community, and hence, all services as common to all individuals in their utilization of the common resources. In other words, access refers to the access a community maintains to a common pool of resources -- this is “heritage normality”.

Whenever common heritage resources are involved, then it is necessary for purposes of ecological stability for a community to turn toward an [egalitarian] access-based model for the management, allocation and distribution of those resources that are commonly accessible, for shared coordination.

Note, herein, the term ‘management’ is applied to common [heritage] resources, and not to people management. It is not the type of “management”, which shall be referred to as ‘human management’ that makes the claim that “leaders mobilize other people to get important things done” - this is ‘human management’, and it is the type of management that “gets things done through other[s] human beings” - it is a parasitical form of organizational structuring that uses others’ energies for personal and righteous ends, and is not too far akin from slavery or “human farming”. Think about this for a moment: the goal of ‘human management’ is not the empowerment of other humans to do things for themselves and for their communities that regenerate fulfilled, self-directed, and self-sufficient lives; it has other ends. Resource management does not have to involve human management; it may involve human coordination, which is not equivalent to human management by a leader or some other [managerial] authority figure. The organization of this economic decisioning system is not based upon social leadership, but is instead, design-led (i.e., it is a design-led vs. a leadership form of organization). “Great design” is a symptom of a design-led organizational structure and an experience-driven development processes.

Fundamentally, to maintain a steady and dynamic relationship with the life ground that factually services the fulfillment off our community, resource management (as a system) must maintain the clarity of humankind’s relationship with its lifeground [in the way in which it arrives at decisions that impact that common heritage lifeground]. The very idea of human management breaks that lifeground connection by ignoring human needs and ecological concerns. Instead of managing “human resources” for economic gain and politically powered purposes, a systematically designed access-based system organizes access to information and resources for transparent contribution to human fulfillment. A natural law/resource-based economy could be said to be a time and [renewable] energy management system, but it is not a ‘human management system’.

When individuals share in the recognition that there exist common heritage resources in a mutually life-grounded ecological system, then it becomes more likely that they will recognize the necessity for economizing (i.e., managing the efficient and effective strategic use of) those resources. Without a collaboratively developed and commonly formalized method for arriving at decisions about common resources, then the clear repercussion is a loss in our synergy as a community, and possibly, the "tragedy of the commons". The "tragedy of the commons" is a proposition that when humans left to their own "devices", they will compete with one another for resources until the resources run out. Hardin, the originator of the idea wrote, "Freedom in a commons brings ruin to all." (Nijhuis, 2021)

An actual “tragedy of the commons” is a state where individuals have lost their awareness that the resources in a locale are commonly connected to the well-being of all local lifeforms (and species). And, the “tragedy of the commons” is, itself, a market-paradigm deduction - it is deduced from the observation that the “tragedy of the commons” is frequently observed “in the market”; it may even be said to be premised on the presence of a market. The “tragedy” is actually a misunderstanding from the ecological systems perspective. In other words, the tragedy of the commons is [at least] a market tragedy - unorganized commercialization of nature has the potential of leading to the exploitation, excessive [over] consumption, and pollution of nature to reduce total resource regeneration and life capacity. The market is the commercialized organization of nature. The market doesn’t recognize an ongoing relationship between individuals among community and nature; instead, it presupposes every transaction (or, most transactions) as finite things with no ongoing ecological and interpersonal relationships.

In his work, “Tragedy of the Commons”, Garrett Hardin was not, in fact, describing a ‘commons’; instead, he was describing a free-for-all where there is no structural or coordinated organization of any kind (i.e., no rules). The “tragedy of the commons” is a free-for-all without community. In the real world, a ‘commons’ is in fact a bounded community that coordinates and manages shared resources in a sustainable manner. The 'commons' is a different concept than what Hardin was describing. In Hardin's essay, everyone just springs into existence and they all "go to town" as rational economic actors maximizing their own utility with a limited but open resource, which is a bizarre notion to contemplate. Except, it is the normative conventional point of view. In the essay, he was projecting his economic premises onto the world in a fictional way, but in a compelling parable.

Garrett Hardin's famous allegory of the "tragedy of the commons" has been modeled as a variant of the Prisoner's Dilemma, labeled the Herder Problem (or, sometimes, the Commons Dilemma). Cole et al. (2008) wrote a brief paper arguing that important differences in the institutional structures of the standard Prisoner's Dilemma and Herder Problem render the two games different in kind.

Oddly enough, the tragedy of the commons has been interpreted to mean that private property is the only means of protecting finite resources from ruin or depletion. And, this is a tragically inaccurate interpretation of what Garrett Hardin initially meant when he explored the acclaimed 'social dilemma' in his literature work entitled, "The Tragedy of the Commons". Therein, Hardin explicitly stated that society should exorcise the "dominant tendency of thought that has ... interfered with positive action based on rational analysis, namely, the tendency to assume that decisions reached individually will, in fact, be the best decisions for an entire society". (Hardin, 1968)

Originally, the "tragedy of the commons" argument was a reaction against (and not for) the contemporary laissez-faire interpretation of Adam Smith's "invisible hand of the marketplace". Adam Smith's laissez-faire doctrine of the invisible hand tempts us to think that a system of individuals pursuing their private interests will automatically serve the social interest. In the essay, Hardin employed a key metaphor, the Tragedy of the Commons (ToC) to show why. When a resource is held "in common" [in a market], with many people having "ownership" and access to it, then Hardin reasoned that a self-interested "rational" actor would decide to increase his or her "exploitation" of the resource since he or she receives the full benefit of the increase, but the costs are spread among all users. The remorseless and tragic result of each person thinking this way (i.e., thinking in competition) is the ruin of the commons, and thus, of everyone using it.

The tragedy of the commons has become a truism, not only in economics, but in political science and public life. The two terms (i.e., commons & tragedy) become so linked in their paradigm that there is no moving beyond them while in that paradigm.

In the essay, and in later writings, Hardin's rejection of more cooperative and systemic design-oriented solutions stems from the individualistically competitive assumptions in the argumentation for his metaphor.

Many years later in Hardin's 1998 essay in "Science", he writes, somewhat unwittingly it might be said, that in a structurally coercive society (i.e., market capitalism), the only way to save society is through a frank policy of "mutual coercion, mutually agreed upon". He goes on to state,

> *"Under conditions of scarcity, ego-centered impulses naturally impose costs on the group, and hence on all its members. Individualism is cherished because it produces freedom, but the gift is conditional: The more the population exceeds the carrying capacity of the environment, the more freedoms must be given up." (Hardin, 1998)*

It is somewhat unfortunate that Hardin's collaboratively developed and formalized method for managing the commons involves the coercive use of force. For in truth, the coercion of the State plus the structural violence of the market is unlikely to preserve anything in the long run. Hardin's misunderstanding of the situation becomes more clear in the final paragraph of the essay where he writes, "Science has been defined as a self-correcting system. In this struggle, our primary adversary should be the nature of things." There are many points that could be made here, but the three that might come first to someone's attention are: (1) any struggle against nature will always end in one's own more quick demise; (2) the market does not have to be the nature of things; and (3) "individualism" as a concept is an "-ism", and therefore, it is separated from nature and unlikely to produce the cooperative, iterative design of more free systems using the discoverable principles of nature to do so. Science is self-correcting, but science must be explored from the perspective of an emergent system.

Fundamentally, the idea that "the problem of the commons" can be solved through "government" is tenuous. The "government" can print its own money, the government can go into debt, the government's primary tool is the violence (i.e., destructiveness), and the government can change agendas - a political government is opinion-based. Are these things problems of the commons? Should we bring "organization" to the commons through coercion by government, through money, debt or force, competition, or capital, or through opinion? The idea that we need a commercially protectionist "public" entity to solve a supposed problem of common lands is likely to spawn a whole host of additional problems. Unorganized common un/ownership is not solvable through the creation and empowerment of a State of Government, which is a massive and generally unowned, exploitable and protectionist, resource.

In general, a 'commons' is a space where people have equal access to the resources and information required to fulfill their needs. A commons-oriented community represents a structure where everyone, all of the time, has the opportunity to participate in maintaining and evolving the community.

Herein, **common access** is access to resources, goods and services that are the common heritage of everyone, the property of no one, and potentially accessible to everyone.

> **INSIGHT:** *If goods are only as relevant as their use, then a system of shared and open access is most efficient.*

3.2 Commons-oriented design principles

A.k.a., Commons-oriented control principles.

What is being accessed (as resources) in community is a common heritage [of earth's resources]. Hence, when accessing a common heritage of all, it is wise to clarify a good interface (structural system) by which any individual (unit) is accessing resources; good, in such a way that the access is not harmful.

The following 8 design principles for managing the commons have been adapted from the 8 principles given by Elinor Ostrom who sought to investigate how communities succeed or fail at managing common pool, finite resources. The 8 principles outlined by Ostrom are:

> **NOTE:** *The community-type societal answer to each of these principles is stated also.*

1. Define clear system boundaries. Without exception, we all are a part of our community, and we each have an equal stake in what happens.
    A. For a community-type society:
        1. Define what is common, and what is personal (and what is team).
        2. Define the legal bounds of the commons (e.g., commons licensing).
        3. Put contribution into the commons.
2. Match decisioning protocols to local needs and conditions. Fundamentally, the things that we all have access to may be organized into a fulfillment-oriented structure, for all of our benefit. We have a mutual responsibility to take care of these commons and pass them on to the next generation in better shape than we found them.
    A. For a community-type society:
        1. Create a global survey (resources, people, needs).
        2. Create a global decision protocol that allows for locally customized configurations of habitat residency.
3. Ensure the continuation of transparency and participation in protocol creation and decisioning modification. Everyone must have the opportunity to participate in defining, restoring, and creating anything that is important to the future of the community.
    A. For a community-type society:
        1. Visualize society through [community] standards.
        2. Education society through [community] standards.
        3. Operate society through [community] standards.
4. Reduce the existence of authority structures and enhance parallel forms of cooperative creation.
    A. For a community-type society:
        1. Contribute to society through a coordinated contribution-service.
        2. Educate others about community standards.
        3. Operate optimized habitat fulfillment service systems.
5. Monitor resource usage and pollution in real-time.
    A. For a community-type society:
        1. Continuous resource survey and resource tracking.
        2. Issue-project tracking survey.
6. Facilitate restorative justice practices; we must recognize and repair the damage that has been done, and the inequities that have been created through systematic restructuring.
    A. For a community-type society:
        1. A residentation plan where people on earth can become residents in community.
        2. A restorative justice plan where people and the earth can become restored from harm.
7. Account for the possibility of disputes in the structural design of the decisioning system (i.e., design-in mechanisms for conflict resolution), and facilitate the self-efficacy and self-direction of individuals in the community.
    A. For a community-type society:
        1. A residentation plan where people on earth can become residents in community.
        2. A restorative justice plan where people and the earth can become restored from harm.
8. Define accountabilities/responsibilities and make them explicit for every systems task.
    A. For a community-type society:
        1. Contribution agreements (work descriptions, roles, skills certifications).
            i. Standards working groups.
                1. Decisions working groups.
            ii. Habitat service teams.
        2. User service agreements.
            i. Habitat residency access agreements.
                1. Habitat dwelling service access agreements.
                2. Habitat common service access agreements.

To create a commons-based (or community-oriented) society people need more than just exposure to new ideas; they need tangible ways of experiencing, practicing and living out possibilities. People can change when they see and experience a better way. To ensure the survival of the community and of our common environment, we must create new systems and structures more closely aligned with nature.

For reference only, the following are Elinor Ostrom's original 8 principles for "governing the commons" (Ostrom, 1999):

1. Define clear group boundaries.
2. Match rules governing use of common goods to local needs and conditions.
3. Ensure that those affected by the rules can participate in modifying the rules.
4. Make sure the rule-making rights of community members are respected by outside authorities.
5. Develop a system, carried out by community members, for monitoring members' behavior.
6. Use graduated sanctions for rule violators.
7. Provide accessible, low-cost means for dispute resolution.
8. Build responsibility for governing the common resource in nested tiers from the lowest level up to the entire interconnected system.

It is important to note here the ways any society can control access to resources:

1. Force (State).
2. Trade (market).
3. Agreement (all).
4. Availability (all).
5. Life-phase (community).

3.3 Two forms of societal-level access

There are two paths that an access-based economic model can take:

1. **Everyone collectively owns everything** - everyone collectively owns "shares" (a 1st level abstraction) in production and/or the whole habitat; or
2. **No one owns anything** - no one at all owns any share in production and/or the whole habitat.

The most efficient of the two paths is for no one to own anything. This community has been designed along the second of the two paths, such that no one owns anything.

A community-type society is a user supported effort. We among community return resources for others to use, because that sustains an equitable economy. In some cases this "return" looks like a library return. In the habitat context, it appears as an integrated materials cycling service system.

> **INSIGHT:** *At the end of the day everyone wants to live somewhere nice, everyone wants to develop their potentials, to enjoy and share in a community of higher potential interrelations, choices, and experiences. We all want [access to] the highest service level.*

3.4 Societal-level resource ("economic") configuring

When considering an economic configuration it is important to consider the flow of decisions and information, and the existence or non-existence of an authority-driven management structure (or powered social hierarchy). Remember, herein, that a given structure will produce a given set of probable behaviors.

There are [at least] three principal forms of economic [access] distribution (or economic configuration) that a society can take. It should be noted here that a socio-economy generally includes some combination of these configurations with a leaning toward one, or possibly, two of them. For example, modern global society is composed of both political centralization as well as market decentralization, with hierarchical social power centralization occurring within the organization of the market. The access-type system described herein is more akin to a form of systems distribution involving decentralization as a "market of competing ideated designs" and not a "market of competing products". The decentralized structure involves "market sharing" (i.e., the movement of information without price) and not "market advantage" (i.e., with price). In community, ideas are shared openly and the most accurate and systematically fulfilling ones are tested, integrated, and then, temporarily adopted.

To integrate feedback, a system must have some centralizing (i.e., centralized) structure. Every decision system has a base operating code ("kernel", "rule-set") that defines what is possible; it defines the limits of the decision space. The "kernel" decides programmatically how to capture and represent objects and concepts. Centralization does not have to mean domination, as it does under market-State conditions.

The three economic network-distribution systems are:

1. **Political centralization:** One player or a small number of partnered (or federated) [game] players control the economy. In other words, there is a structurally centralized capability given to a group of entities in a competing leadership-power market (i.e., politics) for whom may be given the privilege to decide how resources are to be controlled (and distributed) in society. Centralized organizational structures focus "management" authority and "leadership" decision-making into a single "executive" unit with a bureaucracy of hierarchical and laterally competing units, with information flowing from top "leaders" (or "managers") to various lower units. In this sense, a centralized

economic structure is 'autocratic' [though it may have the appearance of looking otherwise].

In a centralized network all nodes send their data to one central node (a "server"), which may then sends the data to the intended recipient. In a system of secrecy and confidentiality, and hence, low accountability, that which happens to the data in between (i.e., at the central server) is anyone's guess. Herein, the idea of 'probable deniability' becomes formed.

Comments on centralization:

A. In centralized organizational structures decisions are made at the top and communicated down through the layers where there is not necessarily accountability. Hierarchies are not necessarily structured to maintain accountability; and, this is particularly the case in a dynamic of competition over lifespace.
B. In a centralized politically power system, the program from authority (or "policy" and legislative "regulation") is [possibly] not to be questioned.
C. Factions [of belief] and political parties tend to favor the centralization (or consolidation) of all [political] power for their own ends.
D. Centralized systems have a single point of weakness and become weaker over time due to their inflexibility to adapt efficiently. In this sense, centralized systems are always "wrong" (because of their single point of failure).
E. The centralization of power [in a social system] into a social hierarchy increases operative control while reducing accountability.

2. **Market decentralization:** Groups compete with each other [in a power hierarchy] over property ownership and for influence in a market [with varying levels of social and economic control], and they [are said to] "share" the power [by currency] - purchasing power buys influence in a lifespace of price. Decentralized organizational structures look more like multiple smaller representations of a single structure, featuring management *redundancies* and more close-knit chains of command. The theoretical "market" [without State influence] is essentially a decentralized hierarchy.

   In a decentralized network architecture data passes through multiple connected computing systems. The two most common types of a decentralized network are: a mesh network and a peer-to-peer network. A 'mesh network' (or "meshnet") is a type of network architecture where each computer is connected to neighbouring computers, this is common with WiFi. Mesh networks have a "self-healing" capability — they continue to work even if participating computers drop out. As a result, the network is typically quite reliable and cannot be easily shut down, as there is often more than one path between a source and a destination in the network. A 'peer-to-peer' (P2P) network is another form of decentralized network architecture. In a peer-to-peer network, the "peers" are computers which are connected to each other via the Internet. Files can be shared directly between systems on the network without the need of a central server. And with an 'open internet' new nodes can be added as needed. In other words, each computer on a P2P network becomes a file server as well as a client. P2P is an example of a social peer-to-peer process where each individual shares resources to build a group resource.

   In a sense, a decentralized network could be characterized as a distributed network of centralized networks. It is important to note that when a decentralized network is scaled or "zoomed out" it resembles a distributed network. But, zooming in on the nodes of a distributed network reveals that the nodes in the network are centralized (or "common") in their communications system and control, in some manner. To this degree, a distributed network does not rely on one single server, but splits the risk by having multiple nodes with a common means of communicating (or "controlling"). In the "market decentralized network" there are industries with their own competing command, control and communications systems [for influence over the acquisition and distribution of resources]. Hence, the market system is fractured in its decentralized distribution; it is not [a] common[unity].

   Comments on decentralization:

   A. It is important to note that ownership is a form of centralization (i.e., it is the centralization of resources around the "owner", as oneself separate from other selves in his/her "right" to the access and "defense" of a resource). This idea is part of the argument toward the observation that a market will always create some version of the State (i.e., political centralization). When ownership and competition are encoded into a socio-economic system, which represent its value orientation, as the system iterates over time, there will exist an increasing monopolization of that which is owned into an organization that is capable of monopolizing conflict and creating a "State".

B. When decentralized systems scale they either collapse or become seen as a distributed (or distributed-decentralized) system.
C. Decentralized organization may refer to the distribution of administrative functions or powers of (a central authority) among multiple local authorities (i.e., management or the lateral element in a bureaucratic ruler ship). In the monetary market this lateral organization is competitive, not cooperative. Yet, cooperation improves resource utilization (i.e., usage efficiency) at scale, through sharing. The monetary market reduces the coordinated utilization of resources through competition at scale.
D. Market decentralization is a reference to competition. Yet, network decentralization doesn't necessarily involve competition; it simply involves the exchange and sharing of information along a medium.

3. **Equalitarian systems distribution (a.k.a., distributed access, egalitarian access, mutually beneficial access, coordinated common access, etc.):** When individuals are both the "providers" as well as the "users" and can directly participate in the information acquisition, service design, and production and distribution (i.e., productive distribution) processes of an economy on a transparent, systems basis. Herein, no socially constructed separator exists to divide the providing creators (i.e., "providers") from the accessing users such that everyone [in the community] remains an unbiased "stakeholder". The transparent application of systems principles to the entire economic process maintains the potential for a state of equalitarian access to the distribution of economic services by the stakeholders, who are both the creative [service] providers and the service users. An equalitarian distribution system is necessarily participative in nature and founded in the idea of "openly formalized access". An economic system based upon systems distribution has attributes of both centralization and de-centralization for it is a systems-oriented form of economic distribution - it is neither based on political principles (i.e., not politically-based) nor market principles (i.e., not market-based); instead, it is based on systems principles (i.e., it is systems-based).

In a distributed network there is no central server, and each node is connected to various other nodes; data simply "hops" through whichever nodes allow for the shortest (or otherwise most efficient) route to the recipient. New nodes may be "dropped in" at any time.

A centralized system has a single point of failure. What we see with the Internet is the distributed production of knowledge, and with economic systems can come distributed computation and material production (e.g., 3D printing technology, p2p physible sharing, and even integrated permaculture). Herein, cloud-computing [in principle] is an excellent example of systems distribution (i.e., it is both centralized and decentralized). Consider a simple web-application: parts of it are running decentralized in your browser (e.g., Ajax). The data may be stored in a single data-center – centralized, but the database is replicated on different virtual machines and in different spatially remote locations – decentralized. The design of the Internet prevents it from being shut off from one switch. The web-application may make use of other services – decentralized, but provides its features via the same URL to thousands of users – centralized. Note that cloud computing is "in principle" (as previously stated) an example of systems distribution; however, cloud-computing services owned by a business entity [in the market or by a government] are still economically centralized (or monopolized) by the business entity and are therefore not an example of systems distribution at an economic scale. This is an important issues, for when social decisioning systems do not progress at the same rate as technology, then a host of unpleasant consequences emerge.

A paper entitled *Cloud Computing: Centralization and Data Sovereignty* (de Filippi, 2012) summarizes the concerns of this form of mixed [value] techno-economic system quite neatly when it states,

"The implications are many: users are giving away their content under a false ideal of community; they are giving away their privacy for the sake of a more personalized service; they are giving away their rights [to the rights of competing and leveraging entities] in the name of comfort and accessibility; but, most importantly, they are giving away their freedoms [to legitimized exploitation] and, very frequently, they do not even realize it."

It is true that shifts in values tend to follow advances in knowledge and technology, but when established and competing interests are involved, then appropriate value shifts can be suppressed for competitive leverage and protectionism [of a power base] to the detriment of all individuals in a society. A distributed system is "centralized" only in the sense that the system keeps track (or trace) of information on a comprehensive habitat-community system basis and information transfer protocols are standardized to allow for the very transfer of information. A unified distributed system is capable of communicating and transferring (or relaying) information between its component parts. The standards for communication are "centralized" (i.e., the same across the whole of the structure) -- functions are centralized. This is, by the way, why you can view a website that may be hosted in Brazil and not have to translate protocols (or standards) manually. One could equate the "centralization" present in a systems-distributed configuration to a stream, which runs in all directions equally and with the same "laws". Hence, a more accurate term for the type of "centralization" described herein might be "coordinated design standardization".

Decentralization can exist at the distributed level also. For example, oil, coal, natural gas, and nuclear industries are highly centralized providers of energy as electricity. Solar, wind, and to a lesser extent hydro, geothermal, and biomass, can be localised and provide the energy requirements of a community that seeks to use them at a distributed level; and therein, the energy derived from these sources could be laterally decentralized into a series of backup batteries.

Comments on systems distribution:

A. On the planet today, humanity now has a methodology for massively paralleled distributed design and production.
B. Distributed horizontal arrangement among cooperating and trusted entities versus a pyramidal or hierarchical "scheme"-atic structure. A distributed system is not "run from central command". A Community is a dynamic fulfillment system designed by its users and run by its users. Access-based systems are naturally distributed in their nature.
C. In a distributed configuration all the nodes can connect to each other; there are no centers. New nodes can enter at any time.
D. Distributed interlinking reduces the potential of [competitors] playing one social service against the other.
E. A systems form of distribution is community-global in scope (i.e., unifying); whereas a political configuration is factional in scope (i.e., divided) and a market is inter-factional in scope (i.e., more divided) -- political affiliations are divided by State nationality and then party affiliation; market affiliations are divided by industry, business entity, profession, lifestyle, and also, national/international affiliation.
F. In a distributed self-organizing system all the elements are, by definition, autonomous: there is no leader that drives the organisation of the system.
G. Redundancy and multiplicity is efficiency in the network world.
H. A distributed system is less likely to encounter system wide blackouts of information, energy and service; its networked design configuration makes it is less vulnerable to natural and man-made disasters – which can be in the form of malfunctioning, natural disaster, or attack. In concern to energy, when localization is applied to such a configuration, it allows for a minimization of energy loss by avoidance of large distances between energy production components and energy usage components.
I. Naturally, as information becomes more available and distributed, then an access-based model becomes more probable.

The following are several notes on economic configuration design:

1. One may also speak of the idea of centralization in terms of outcome(s) and vision. Therein, a "centralized" outcome might be seen as the 'purpose' of a specific system or structured organization. Yet, in the case of the Community, the term 'centralization' seems inaccurate and inappropriate, for the purpose for the Community's existence is in fact emergent in its semantic form; and its orientation is distributively adaptive to its environment.
2. The Internet, by definition, is centrally planned in the sense that it has relays, common technologies, and standardized protocols (e.g., http, ftp, arp, smtp, tcp, and the future spatial web). In other words, the Internet utilizes a set of shared, common and centrally developed standard protocols. Without these "central" and commonly designed systems information could not pass from one end point to another. Herein, the centralization is in the systems logic, which allows for systems

to communicate effectively and efficiently with one another. There is a fundamental difference between political centralization and systematic design centralization.

3. In a self-organizing system the control is distributed [amongst the localized actions of individuals], and all parts of the system contribute to the emergence of the system's organization[al behavior]. The system's resulting behavior is a result of the numerous interactions among the system components.

Fundamentally, humankind now has a methodology (i.e., the systems methodology; systems architecture) for massively paralleled distributed design and production by users for users [without the addition of politics or the market]. Herein, an economically distributed system is "centralized" only in the sense that the system keeps track (or trace) of information on a comprehensive habitat-community systems basis -- information and processing are systematized, distribution is distributed and decentralized, and production is localized where technically possible.

Note, there exists a point of confusion amongst defenders of the market system that in criticizing the de-centralization of the market, one must be advocating for [authority-driven] centralization in another form. In the free-market thought paradigm, if you criticize market-decentralization, then you are for socialist-political-centralization -- there is no other option that can be computed in the paradigm; hence, a false dichotomy is created and the idea of the "economic calculation problem" arises (or is reinforced).

An access-based system represents a move from owning one of everything to a larger economic system designed for access to goods and services as needed and otherwise desired. The so-called "sovereignty of ownership" is a distortion of the reality of the situation. If John Locke were alive today and understood systems thinking then he might quietly be revising his claim that liberty cannot exist without private property. Truly, the understanding is arising that ownership (Read: external restriction on a particular good, service, or other lifegrounded form of individual need) is not in fact itself a "right", but that ownership is in fact the resulting behavior of a technical limitation of the ability to access said good or service in any other way. Before networked computing, the possibility of a community city was impractical.

A great deal of wealth exists when resources are coherently organized and made available. Herein, information acquires greater coherency and solutions become more transparent when life is shared. And yet, it is important to remember that in early 21st century society there continues to exist industries and establishments that benefit off of the back of a structure of restriction, scarcity regeneration, and the division of unification.

An egalitarian [strategic economic] design is one of the few economic designs that has the potential for providing a high-standard of known living (i.e., a high quality-of-life) to an entire community's population through the recognition of commonality among humankind (e.g., needs and environment) and organization based upon cooperative coordination. In other words, this system is designed to strategically provide for the greatest fulfillment of everyone's common needs and individual preferences (among the whole community of individuals in a systematic manner), and not the greater/est good for the greater/est number, which often leads to political systems and a tyranny of the majority.

3.5 Access sharing

At the core of the access system is the Earth, the common heritage, which is an existing "thing", a complex interconnected systems "thing" that sustains us all. The sharing of knowledge about this "thing" and our relationship to it is essential, not just for the Community, but for each and every one of us as an intrinsically motivated individual. Therein, the sharing of information and of access comes naturally from a common perception of connection to nature, and it creates the potential for community. Wherein, the persistence of a community necessitates the sharing of knowledge and technical ability to maintain fulfillment and optimize well-being.

The idea of accessibility [to a service or a good] carries both a spatial and temporal nature. In other words, access can be sub-divided into spatial elements and temporal elements, and in logistics these factorial [data] elements are modeled together in what is known as a spatial-temporal model of the engineered [logistical] service system. In other words, time and space form an 'accessibility dynamic' in the engineering of an economic system for service fulfillment. It is important to note here that most, if not all, "living" self-organizing systems express such dynamics [that create different 'emergent behaviors' as the system changes over time].

Socio-economic systems have dynamics that are strongly correlated and coordinated in space and time, and all typically display a multiplicity of spatial [localization] and temporal [prioritization] scales, dependent upon their drives, values, methods, encodings, and possible paradigmatic assumptions.

Therein, a distributed and integrated economic system may be said to be composed of interacting spatial networks representing a mixture of individuals and technical computing systems, each having (1) one or more inputs, (2) an internal state variable $x(t)$ that evolves in time in response to inputs, and (3) one or more outputs. In the case of individuals, we are highly complex living systems and at a very basic physiological level we have inputs, processes and outputs, which should not be taken to purport that as embodied beings we are mechanistic in the totality of our nature. In the case of computing systems, there are many different kinds of computing system from development systems to integrity testing systems; wherever computer processing occurs [spatially] there is computing [in iterative time, Δt].

In such a system, material goods and service structures have a spatial location that you can point to and say, "that is a car, which is part of this transportation network that includes both people and computing hardware as well as a material infrastructure of which that road is a spatial part upon which there is transport at some frequency". Processes and organizational services maintain a primarily [iterative] temporal nature; they are purely information systems, the representation of which for computing systems may be said to be the electron and for embodied consciousness it may be said to be the body. Just like the ledger of a digital blockchain (e.g., bitcoin), each state of the economic system is modeled and distributed in time. It may be said of a particular service, once the information model is visualized, that it had "this" *specified* organization at "this" *specified* point in time, designed for "this" *specified* functional purpose with "these" [negative feedback] consequences. In essence, services are temporal, spatial, and conceptual information organizations.

Herein, service systems are strategically designed for access, which enables the modeling of the utilization [of resources as they move through a service system] based on actual use time. Along with data on actual demand, the patterns of use of any given service/ good may be analyzed to determine how regularly (or intermittently) it is being used (or accessed). Transport vehicles, recreational equipment, project equipment and various other genres of goods are commonly accessed at relatively distant time intervals, making the task of ownership not only somewhat of an inconvenience given the need to store these items, but also clearly inefficient in the context of true economic integrity (i.e., an economic-orientation that seeks a reduction of waste at all times). If properly configured, an economic system based on access and the efficient allocation of natural resources would maximize societal benefit per unit of natural resource.

In the Community, users are designers and designers are users; everyone is a "stakeholder" and everyone knows it; they don't have to be conditioned to believe it; instead, they are intrinsically motivated to experience it. Wherefore, if there is a weakness in the economic logistical distribution system, then everyone has an incentive to fix it. A decision system designed to generate systematic access must substantially share information and problems, it must organize transparently, formally, and in a person-independent manner.

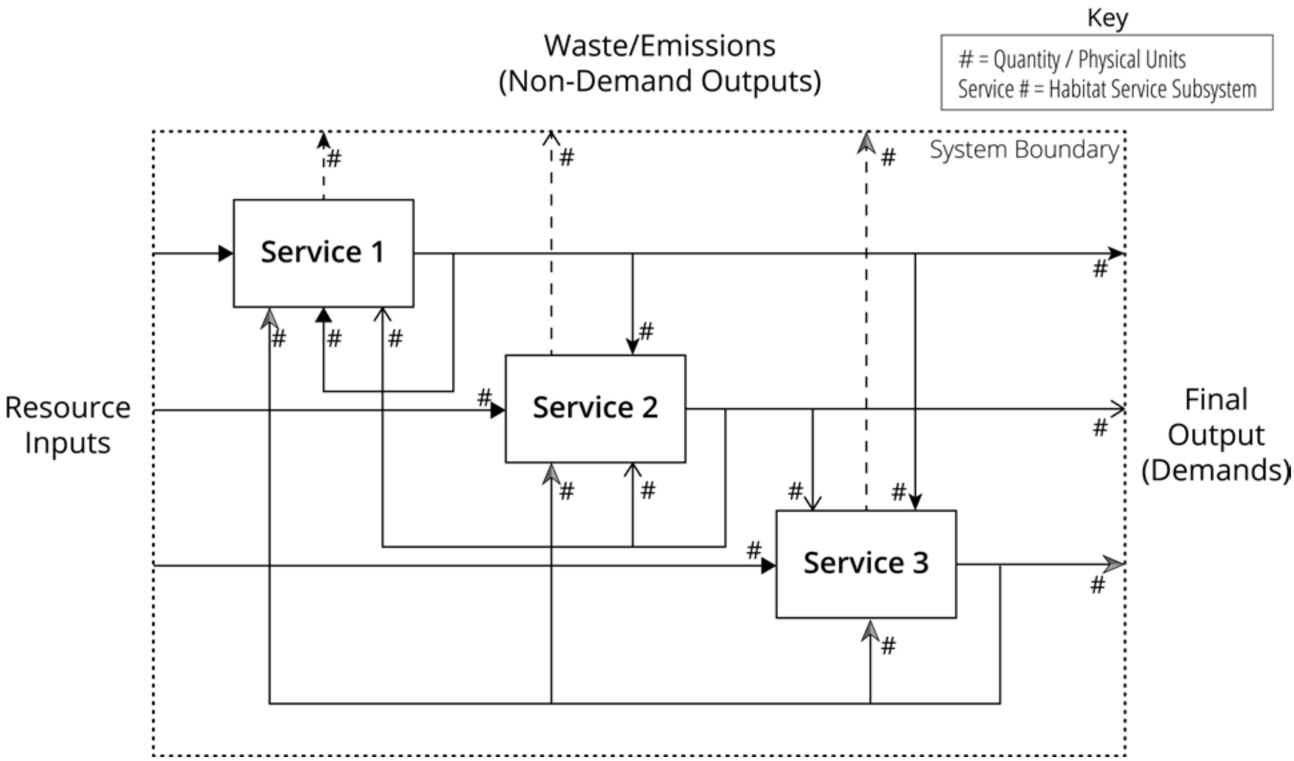

Figure 12. *Conceptual framework of an input–output system. Three service systems are shown. These service systems take in resources (left system boundary). The service systems have two outputs: non-demanded outputs that are a byproduct of the service systems processes (a.k.a., wastes/emissions); these are connected to the top system boundary. These wastes/emissions may be inputs into other service systems, or they may be recycled or disposed of. Then, there are the demanded outputs of the service system (a.k.a., final outputs); shown at the right system boundary. (Tan, et al., 2018)*

INSIGHT: *A distributed system distributes information over space and time, and in so doing it becomes increasingly resilient.*

3.6 Access-based in comparison to property-based

MAXIM: *Nature becomes disconnected through ownership. Property disconnects social relationships. Profit disconnects self-relationship.*

An access-based model exists in contrast to an ownership-based model (i.e., property-based model). An access-based model is a more accurate conceptual model of the real world, involving the verifiable observation that all physical resources are, in actuality, transiently accessible in nature. Conversely, "ownership" is a social construct and exists outside of the nature of the real world where access is universal. The encoding of the socially constructed idea of "property" into an economic system establishes destabilizing systems properties where useful and accessible objects that are actually transient in nature (i.e., natural resources) become the exclusive access and use of one entity. In a system, the encoding of the idea of "property" corrupts and obfuscates feedback. Hence, property-based systems are unable to re-orient themselves effectively. Such systems are essentially unstable like a three-dimensional twirly top oscillating until finally it fails-over; they are not self-stabilizing like a regenerative gyroscope.

Empirically, there is no such thing as ownership, there is only access, and in the real world access is of an incrementally temporal nature (i.e., it involves time; Δt). Essentially, in the existent real world there is no such thing as property, there is only access; yet, individuals can socially agree (or be forced into accepting) a property-based model. The very idea of 'property' can subjectively filter perception and encode itself into a society's socio-economic system, but that doesn't mean the concept accurately reflects the 'access' that is occurring.

The notion of 'property' as self-owned or self-ownership and all that ownership entails, such as private property, is obsolete under the structure of an access-based system. The more factual idea of 'access' makes private ownership obsolete.

In an access-system an accessed item can be returned at any time for re-processing through the community's system. In a property-system an item of property is transferred and exchanged; hence, the idea of systematic resource re-processing (e.g., cradle-to-cradle design) is difficult if not impossible to effectively organize due to the transfer of responsibility through property exchange.

Ownership establishes a boundary to the most efficient coordination and re-processing of resources within a life system. If an organism, which has a supra-system perspective, can no longer allocate resources systematically because its intra-systems have ownership over interdependent resources, then the organism will no longer function optimally or remain in a state of dynamic and healthy equilibrium with its environment. Instead, a system of competing interests has been established and the life system enters into a state of decay. **Optimal decisions** in an access-based model are decisions about the allocation and occupation of interdependent resources that are coordinated to serve the homoeostatic functioning of the organism and the continued persistence (or purpose) of its existence.

Access to items when they are needed releases individuals from the property-based requirements associated with individual ownership of items. This may not appear to be a "big deal", but when accounting for all of the factors that ownership entails, it becomes highly relevant to a community's economic model. In a property-based (and free-market) model, ownership of an item transfers responsibility for that item from the producer to the owner. Under regulated market conditions the producers may still have ownership over the items they produce even after their commercial economic "sale" (or exchange/gift) to consumers (e.g., copyright and the U.S. Digital Millennium Copyright Act). Under hypothetical non-governmental free-market conditions, the consumer (or new owner) becomes solely responsible for the items storage, safety, transport, maintenance and recycling/disposal, among other functions associated with "responsible ownership" – someone "taking care" of their belongings (with degrees of incentive). In contrast, under an access model, the community (including human activity & machine activity) optimizes the fulfillment (or coordination) of these responsibilities, not any single individual or social group (class, nationality, or race). An access system is a system of and for mutual benefit. A property system benefits those with property and those with access to property (including, inheritance and gifting).

In practice, ownership acts as an external restriction on a resource, good or service. The concept of ownership exists in part due to the social and technical limitations of a society to provide flexible access to needed goods and services in any other way.

Someone who is owned is by definition not free. If someone's labor is owned in the marketplace, then that someone is by degree not free. It is an intellectual dodge or cheat to claim that the market is a place of freedom when there is ownership, and in particular, ownership of labor. It is quite clear that if someone can labor for "you", then they can labor for themselves in a community, without having to change bodies or change minds or make any fundamental change to who and what they are and how they operate in the world. They can go and do for themselves and for their community without ownership.

Ownership is not a real limitation of technical feasibility, it is a deliberately introduced constraint, which compromises capability and subordinates it to some other concern. In many cases that primary concern is "profit". In the digital economy it becomes the "piracy of intellectual property". Sometimes it even involves a deliberate breaking of the hardware -- broken (i.e., functions disabled by the "landlorded" business) and purposefully placed behind an "ownership" wall.

Ownership structurally de-incentivizes accountability for socio-ecological viability as it is inherently a structure that generates opposition (i.e., competition). To be remain viable in a system (e.g., the earth's bioshpere) we must accurately sense our environment. When we come together in villages, towns, and cities, we must accurately sense our environment at not only the individual level, but at the socially networked level also. In other words, we must be precise in our decisions so that our structures and behaviors align with regenerative sustainability as the population scales. If we scale without retaining a fulfilling alignment, then we risk our viability.

Ownership isn't a 'first principle'. You own something so that you have exclusive and unlimited 'access' to it; thus, access underlies ownership, and this is what an access-based system seeks to optimise, shared access (not the divisionary construct of ownership).

Further, any claim of ownership within a system, particularly a biological system, will cause the entire system to become unstable. If system entities begin "laying claim" to resources (as those substances that allow for its continued existence), then the system will eventually cease functioning in a stable manner from competition over resources that would otherwise be allocated and occupied in a systematically and strategically coordinated manner for the system's purposeful survival. And therein, the authority of the day will determine how rightful things are, how liable its participants are, and how much force to apply to modifications to the concept of "property ownership".

Also, individual ownership is inefficient within a community. Ownership, more than anything, is the personal burden of transport, maintenance and storage, and of disposal. In an access-based community needs are fulfilled cooperatively and through strategically efficient design, leading to a minimization of repetition, duplication, stagnation, deterioration, the non-use of a useful thing, ecological pollution, and waste & decay.

Ownership is [in part] characterized by the concepts of **liability**, **rights**, and **force** (and **trade**, as the processing element). Ownership involves the right of a claim, a greater claim than someone else [often through a "public" or higher authority]. Life becomes a spectator sport, a box. Ownership involves personal liability between players in the game of ownership. Ownership requires force to prevent someone else from claiming ownership. Force is a characteristic of ownership, and not necessarily a characteristic of the concept of 'access'. A property-based model is by its characteristics a force-based model; force is required in defense of property [from that which is referred in a property-based paradigm to as "theft of property"].

> *"The notion of "rights" is inseparable from the history of "property" or privatisation of nature, resources, processes, knowledge, and so on, for appropriation, consumption and control by the powerful, who can take possession of objects by force, excluding others."*
> *- Farhad Mazhar (Mazhar, 2007)*

In the German language, there is a saying, "Property comes with duties attached to it (e.g., something owed in return; responsibilities; tax; upkeep)." Except ... in a free-market it doesn't, and in a regulated market the duties are backed up with force (and threat of violence) by the State.

Any ownership over resources, individually or socially (as in "public property" managed by government), will eventually lead to the establishment of authoritarian force-mechanism constructs -- a paradigm wherein force is claimed to achieve right and proper[ty] action (as in property rights). Behind all *liability* and *property rights* there exists force. Therein, power fills in all the crevices where power is given over to another to apply through coercion or contract[ed negotiation].

Commercial researchers, for example, are highly likely to race to take credit for research-led therapy that increases survival, but not so equally attentive to the possibility of harm or the retraction of statements that were once accepted when later analysis shows harm or fraud. Commercial researchers are often not so attentive to retractions due in part to the issue of liability. In competition, liability is seen as a potential weapon (a variable in market gaming strategy).

For the past three hundred years or so, industrialised societies (or at least the class of tangible property owners within them) have become increasingly preoccupied with property, its privatisation and its protection - in the

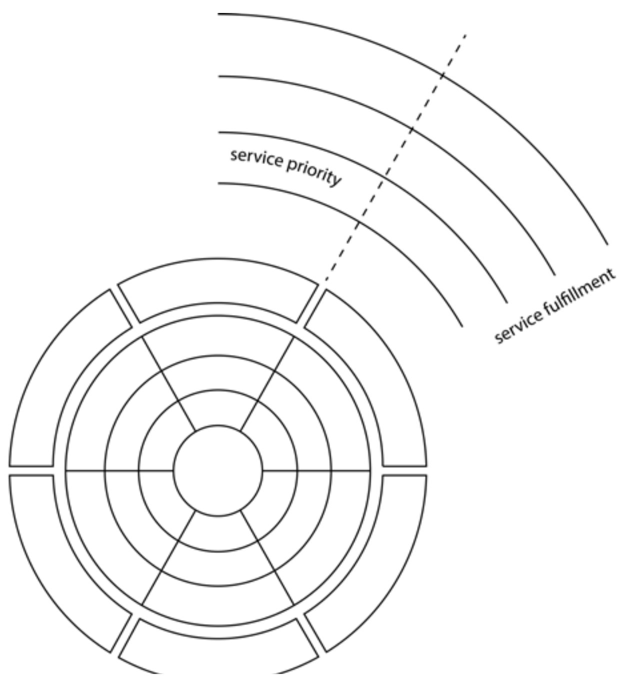

Figure 13. *Concept diagram depicting service systems with service priority (i.e., some services are prioritized) and service fulfillment (accountable degree of completion of service system demand).*

form of the accumulation of capital and financial control. The historic debate about property ownership has been framed as being between enclosure and commons as between "private property" and "public property" (governed by the State). Therein, the ideology of personal (and now corporate and governmental) greed has become the unquestioned driver of "the economy", with its assumption that humans are motivated only by the prospect of infinite acquisition, and that progress results solely from increased production (or productiveness) and consequent, infinite economic growth. Such an ideology is quite out of alignment with the reality of fulfillment and *how a common habitat area might be organized into accessibly coordinated service systems that fulfill a community of individuals.*

It might be interesting to learn how 'property-based' terminology is being and has been redefined over the centuries to include ever more of that which exists in the real world, and one might start with Roman Property Law. (*Roman Property*, 2020) There are at least 5 general categories of "public property" that have been redefined as private property: Res nullius; Res communes; Res publicae; Res universitatis; and Res divini juris. A property-based system incentivizes "property owners" to further spreads their market demand more deeply into that which naturally exists in common.

Many of the social and economic concepts in modern parlance are terms of a property built world. Under an access model an individual could neither be said to "steal" nor "sell" nor "pirate" items that no one owns. In other words, the concepts of "stealing" and "selling" have no meaning in an access-based system. Personal property is sacrosanct in highly materialized/materialistic commercial cultures. Even in their work environment, with equipment allocated / issued by an employer, people can have a strong identification of something being theirs, which might be epitomized in the common office statement, "can I borrow your stapler". We must be careful of the language that we use because it shapes social and economic problems.

> *"I'd be a bum in the street with a tin cup if the markets were efficient."*
> *- Warren Buffett*

3.7 *Induced demand*

In the market-State of the early 21st century, production is primarily driven by the pursuit of profit rather than meeting genuine human needs. The capitalists producers produce products and services, which they take to market to sell. Buyers then look at what is available, at what price, and then, make their purchases. Rarely, do the end-consumers place orders for products prior to their production (Read: pre-orders, white-list orders). In other words, in the market, access is generally considered to be accounted for after production (Read: post-hoc, post hoc, ex post, a posteriori, etc.). The capitalist produces, and then, must induce demand from the public. That induced demand may be for something that is actually needed and desired, or it may be a manufactured desire (without genuine human need) for the profitable benefit of the producer. Additionally, in the market-State, most people find out about products after they are produced. In other words, after production, the producers have to induce demand [for the product] in the population through marketing (propaganda).

As a result of producing without directly surveyed demand, there is a tendency for capitalist production to generate more goods and services than are wanted and can be absorbed by the market. This leads to a situation where there is a surplus of commodities that cannot be sold profitably (i.e., overproduction). Overproduction refers to a situation where the production of goods and services exceeds the demand for them in the market. It is closely related to induced demand, as it highlights the contradiction between the necessity for profit (in capitalist production) and the limited purchasing power of consumers. To overcome this overproduction crisis, capitalists employ various strategies to induce demand and stimulate consumption. These strategies include advertising, marketing, planned obsolescence, and other manipulative tactics aimed at creating artificial desires and needs among consumers. Induced demand reflects how production in the market-State, driven by profit motives, generates imbalances between production and consumption.

> **NOTE:** *Commodities are products (and services) specifically produced to be traded [for profit].*

In a community type configuration of society, access is engineered, starting with user requirements (genuine human needs). Needs and requirements (including strategic preservation protocols) are taken in before production (Read: ex anti, a priori, etc.) and composed into master-plans, which are then executed, produced and operated, for some cycle of time. In community, production is flexibly planned beforehand, and people have some idea of what they are going to, and expected to, consume (with flexibility) over some production cycle of time.

3.7.1 The manufacturing of demand

Early 21st century society has become a lifestyle of unnecessary spending deliberately cultivated and nurtured in the public by economic establishments (i.e., businesses and States). Companies in all kinds of industries have a huge stake in the public's penchant to be careless [with their thinking, their money, and their resources]. Soni and Upadhyaya (2007) carried out a study on what effect the nagging of children had on their parents' likelihood of buying a toy for them. They found out that 20% to 40% of the purchases of their toys would not have occurred if the child didn't nag his/her parents. Similarly, one in four visits to theme parks would not have taken place. Industry markets directly to children, because industry knows that it encourages them to nag (pester) their parents to buy them the advertised products and services.

> *"You can manipulate consumers into wanting, and therefore buying, your products. It's a game."*
> *- Lucy Hughes, "The Nag Factor"*

These are only several small examples of something that has been going on for a very long time and to which we have become 'normalized'. Enterprising businesses didn't make their vast financial wealth by earnestly promoting the virtues of their products; they primarily made it by creating a culture of billions of people that buy way more than they need and try to chase away dissatisfaction with money.

Marketing campaigns exist to manufactured demand. In part, advertising exists to implant in "you" new desires that "you" may not have had before. Therein, advertising tells us that happiness is at the end of our next purchase. Advertisements are paid endorsements.

To add to the confusion inherent in early 21st century society, marketers give names to products and services that have nothing to do with their function. Marketing always comes down to one thing, perception; it is not about your product or its features. It is a very deceptive way of looking at things. Marketing is all about how others understand your product, not how you understand the product. (Ries et al., 2009)

Marketing follows the same principles as propaganda. One is done by the State and political candidates, and the other is done by businesses. There is corporate and political marketing, which are synonyms for corporate and political propaganda. In both cases, marketing exists to manage peoples' emotions and perceptions. Special interest groups and entities in the market are continuously rolling out unseen narratives designed to manipulate opinion. Therein, advertising becomes the act of amplifying opinion by paying other people to repeat that opinion. Simply, advertising is being paid to say something. Advertising is a form of persuasion that can be made increasingly effective until it reaches a critical point, wherein if used improperly can enable the group that wields it to manipulate and hijack an entire civilization.

There are countless euphemisms used in early 21st century society for propaganda, including but not limited to advertising and marketing, lobbying, public relations, public diplomacy. Propaganda employs a lot of people in early 21st century society. And yet, in early 21st century society, they don't see it as propaganda; instead, they say things like, "we are educating people", "we are providing them with information", which is misrepresentation, and makes it extremely effective. Because, propaganda works best when you don't see it for what it is (i.e., when it is sophisticated). "White propaganda" announces itself as propaganda, and "grey propaganda" that disguises itself as journalism or product placement in movies. Fundamentally, propaganda assists people in deceiving themselves.

> **NOTE:** *Propagandists, instead of questioning authority, they question those who question authority.*

Industry will take every opportunity to sell more [stuff]. Retail stores are well known to apply scientifically backed strategies to make it more conducive for a [potential] shopper to spend more. Retailers purposefully modify the shopping experience to make it more likely that those inside their store will spend money. The .99 versus 1 dollar is just one example. Therein, proven methods of manipulation are used to drive sales and profit. Just moving products around a store to locations that are easier to access or more visible increases their sale. In other words, whatever the manufacturers put in certain locations correlates to an increase in their sale; and this is why they pay the retailers "slotting feed" to put their

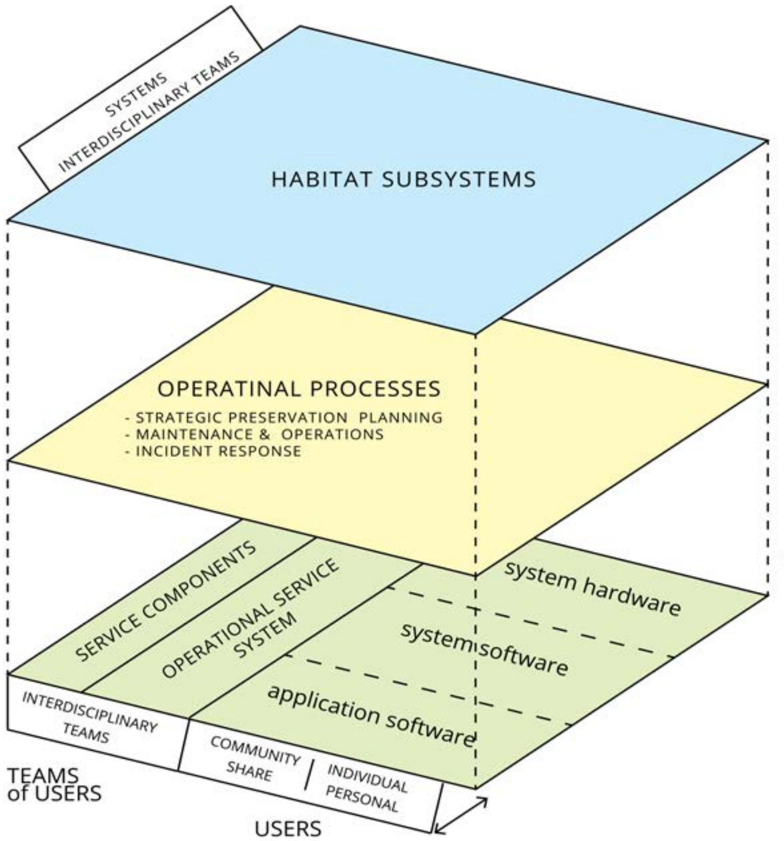

Figure 14. *Habitat service subsystem decomposition model.*