ESCALADE

INFORMATION DESIGN FRAMEWORK FOR SYSTEM MAPPING

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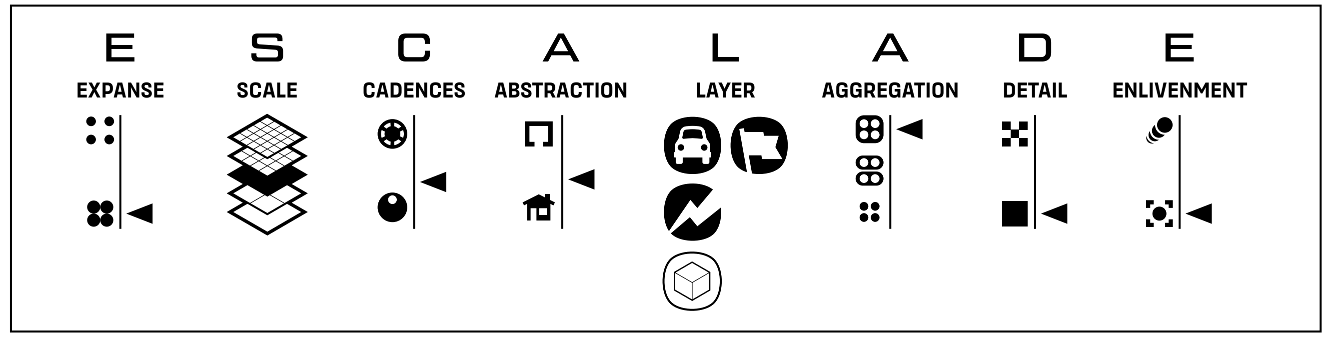
VERSION 1.0

System-map designs can differ along eight dimensions. If all eight are "dialed up" to full realism for a given system model, the map and the territory would be the same; an absurd situation that defeats the purpose of a map, which is to be selective in its representation. If "dialed down" to full simplification, the system model would also be unhelpful: too cryptic and nondescript to be recognizable as a particular system. The point is to calibrate the dimensions so that the map is fit for a range of practical purposes, such as a type of viewer using it to complete certain tasks under particular circumstances. Think of the figure on the right as a dashboard that summarizes the dimensions for a particular map.

DASHBOARD



Some dimensions will be a function of other dimensions. For example, as expanse changes to smaller (less dense) set-pieces, the amount of detail will optimally be reduced too. Likewise, as aggregation increases the amount of abstraction will likely increase to better represent the heterogeneity of the summary grouping. As a general tendency, as scales get smaller spatially, the cadences of cyclical rhythms will increase. Thus, when designing a map, it is good to think about these sorts of dynamic functions. As mapping moves towards interactive media, these sorts of relations could be the source of automatic adjustments in the interface.

SYSTEMVIZ

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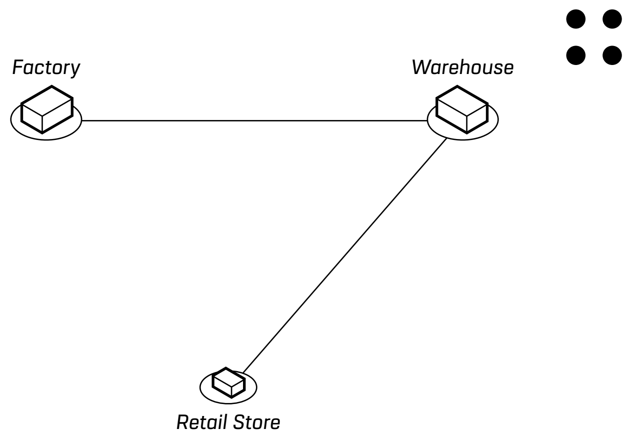
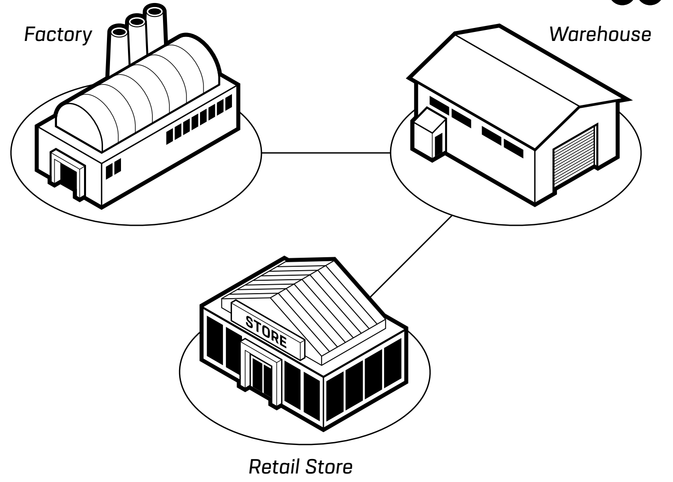
E

Expanse is the treatment of spatial proximity and density. Distances in the system are expanded or collapsed to fit the map. Relative sizes of objects are adjusted. Visual cues may be used to preserve information about actual dimensions and size differences.





S

Scale is the level of analysis, or the objects and activities that are observable at a particular order of magnitude (both space and time). Choices about the levels of scale depend on the subject-matter, instruments of observation, and purpose of the map. Graphical devices (such as call-out boxes) can selectively accommodate more than one level on the same map. A generic list of scales is offered as a rough guide:

SPACE SCALES

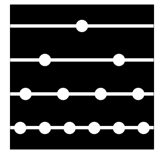
HYPER SCALE	EXO	*Outer*
	SUPRA	*Above, Over*
	MACRO	*Very Large*
	MESO	*Middle*
	MICRO	*Near Surroundings*
	HUMAN	*Experiential Proportions*
HYPO SCALE	MINI	*Minuscule*
	MICRA	*Tiny*
	NANO	*Very Tiny*
	PICO	*Elemental*
	EXI	*Extreme Smallness*

TIME SCALES

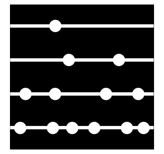
HYPER SCALE	PETA	*Geologic Time (Chrons to Eons)*
	TERA	*Millennia*
	GIGA	*Decades-Centuries*
	MEGA	*Months -Years*
	MESO	*Weeks -Months*
	KILO	*Hours-Days*
	HECTO	*Minutes-Hours*
	DECA	*Seconds-Minutes*
	MOMENT	*Experiential Proportions*
HYPO SCALE	CENTI	*Reflex response*
	MILLI	*Neuron firing*
	MICRO	*Latency of optical computer networks*
	NANO	*Laptop (GHz) micro-processor cycle*
	PICO	*Fastest micro-processor cycle*
	FEMTO	*Ultraviolet-light wave cycle*
	ATTO	*Finest timing control of lasers*
	ZEPTO	*Electron oscillation cycle*

C

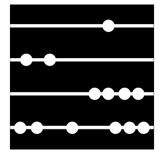
Cadences refers to encoding of the system's temporal rhythms into the map. A map may be *synchronic*: a snapshot at a single point in time. It may be fully *diachronic*: all recursions, time signatures, and state changes are described. In between those poles, only certain cyclical rhythms and state changes are included. The following pace layers indicate the types of cadences that can be encoded.



PERIODIC
Different sub-systems and processes change in regular intervals of different duration



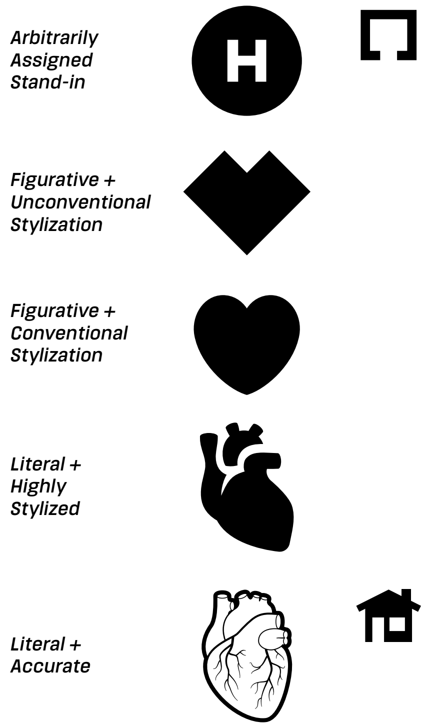
QUASI-PERIODIC
System change happens at intervals that are not regular (or not entirely so)



NON-PERIODIC
System change does not happen over periods that can be identified as intervals but their accumulated occurance can be noted

A

Abstraction is the visual accuracy of how objects are represented. Highly abstract stand-ins on a map may have no visual correspondence to the actual thing in the real world. They merely act as arbitrary symbolic placeholders. Less abstract objects have a literal correspondence and are depicted more accurately.

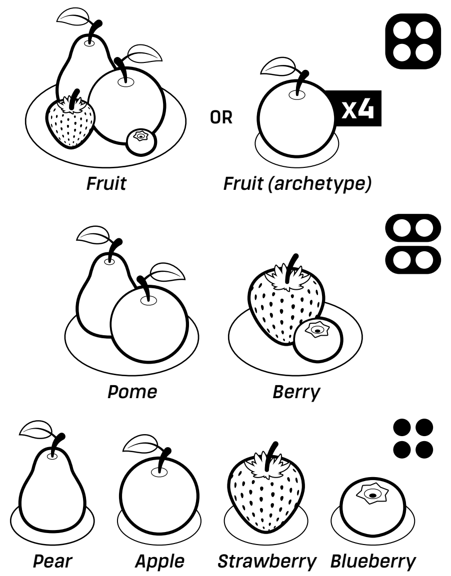


L

Layer refers to the different types of system or subject-matter that can be added to map. More than one type can be included to indicate how different types of system interact. For example, a map may include a city's transportation system or the electrical system. Or it includes both, emphasizing where they interact. Aspects of the political system may be added to help explain some of the system patterns. These can be thought of as layers that are overlaid onto the map. That implies common points of reference to orient the layers, such as physical structures including as buildings, roads, and bridges. Thus, the map can include both foreground and background layers.

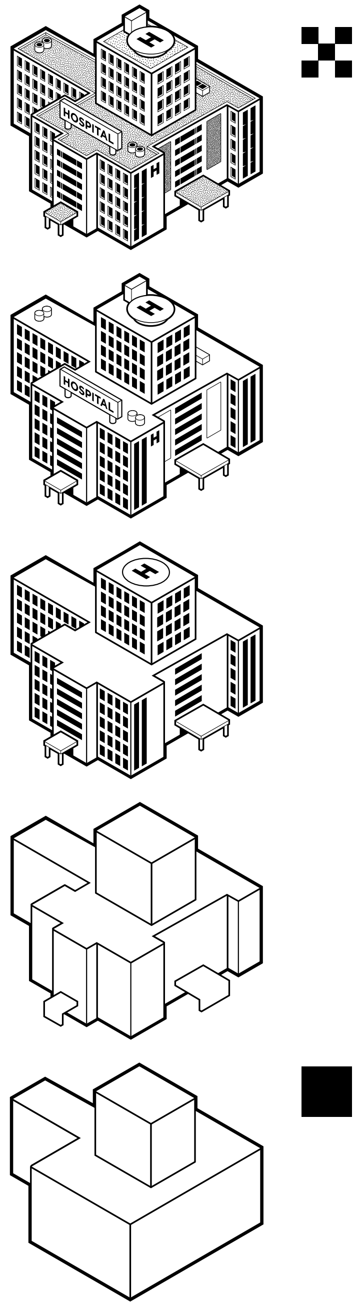
A

Aggregation is the extent to which like items are grouped together into kinds in order to summarize non-salient variation within the model. Highly aggregated maps are simple and tidy but reductionistic insofar as they conceal variation of potential interest to the viewer.



D

Detail is the amount of visual distinctions used to represent objects in the map. High levels of detail may improve realism but at the cost of distracting features that add unnecessary busyness to the map (visual "noise").



E

Enlivenment is the use of motion, sound, and interaction in the map to demonstrate system behaviour or create responsive map interfaces. Maps can be purely static, with information about system dynamism encoded using arrows and other proxy indicators. Alternatively, animation and motion cues can make the map appear more "lively" (motion blur simulates animated action in the figure below given the limits of this static medium).