

Dynamic System Property: *atis*Behavior

(Dynamic system properties are those properties that are part of the theory and describe patterns in time as change occurs within a system or between a system and its negasystem.)

Behavior, $\mathcal{B}(\mathcal{S})$, =_{df} a sequence of general system states.

$$\mathcal{B}(\mathcal{S}) =_{df} (\mathcal{S}_1, \mathcal{S}_2, \dots, \mathcal{S}_n)$$

Behavior is a sequence of general system states.

Behavior, being a sequence of system states, is a dynamic property that is dependent on the time-order in which the states occur. General system state, however, being a list of system properties, is not dynamic and the order of the properties is not important. Therefore, behavior can be defined by the following array in which the order of the properties within each state is not important, but the order of each property-list defined by the capital letters is important.

$$\mathcal{B}(\mathcal{S}) =_{df} (\mathcal{P}_1, \mathcal{P}_2, \dots, \mathcal{P}_n, \mathcal{Q}_1, \mathcal{Q}_2, \dots, \mathcal{Q}_n, \dots, \mathcal{Z}_1, \mathcal{Z}_2, \dots, \mathcal{Z}_n)$$

Shown as a matrix, the progression of the general system states can be defined by an APT&C value for each state, which then yields the system behavior.

\mathcal{S}_1	\mathcal{S}_2	...	\mathcal{S}_n	
\mathcal{P}_1	\mathcal{Q}_1	...	\mathcal{Z}_1	}
\mathcal{P}_2	\mathcal{Q}_2	...	\mathcal{Z}_2	
...	
\mathcal{P}_n	\mathcal{Q}_n	...	\mathcal{Z}_n	

⊨ $\mathcal{B}(\mathcal{S})$

It is important to note that ‘ \models ’ is not the same as the logical ‘ \vdash ’ of the Predicate Calculus, although the connotation is the same. The logical use of ‘ \vdash ’ will be defined in a separate paper.

Behavior is defined by a list of characterizations; that is, properties. Should a characterization be observed that is not listed as a property, then define such characterization in terms of the *ATIS* language and add it to the list of properties. The list of system properties is not comprehensive, and allows for additions as required.