Viewing the world systemically.

ATIS—the –Put Properties of Intentional Systems

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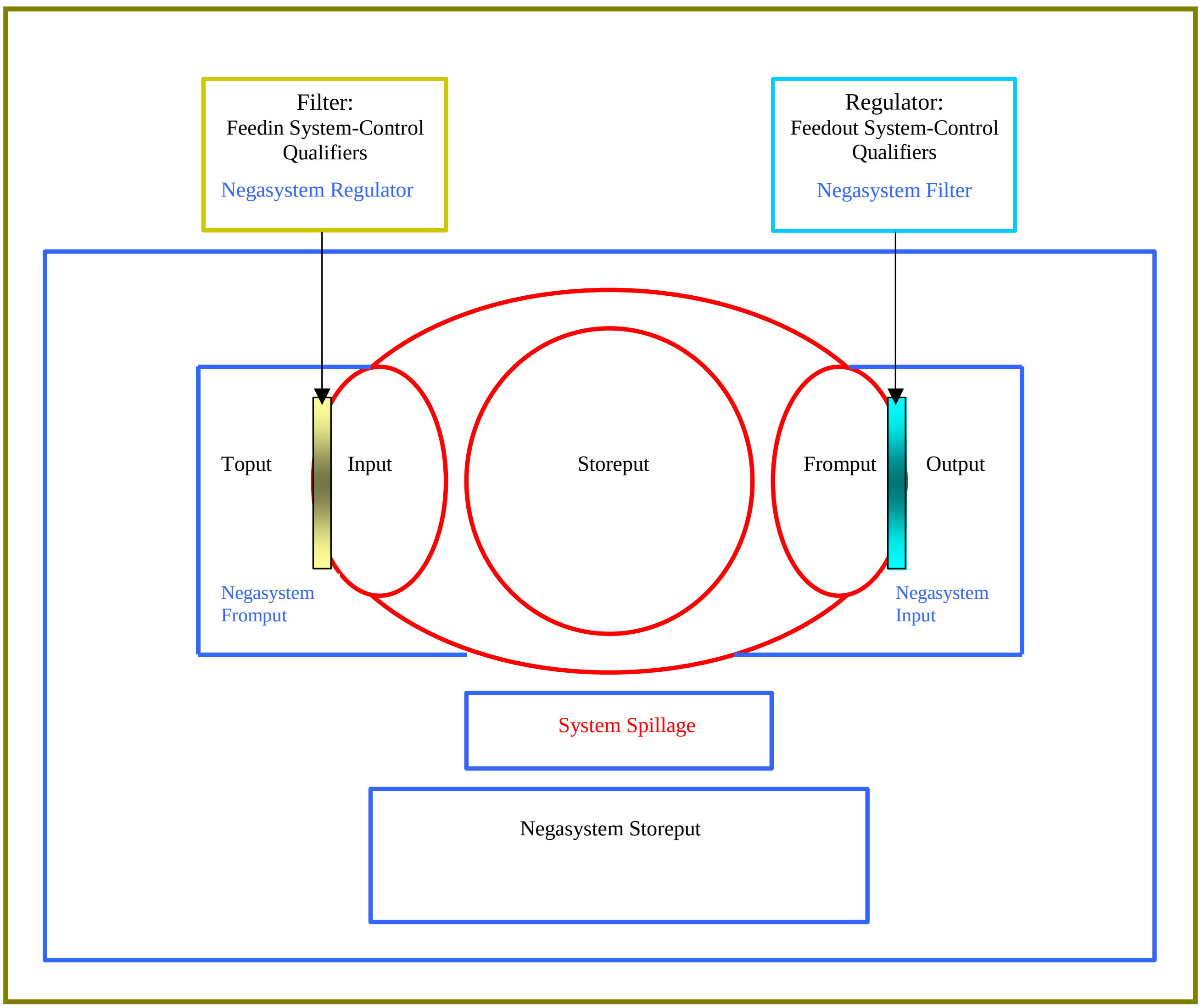
The –Put Properties of Intentional Systems

Overview

–Put properties are *Structural Properties* that partition a system into disjoint sets. –Put properties, $V_{\mathcal{P}}$; consist of five properties: *Toput*, $T_{\mathcal{P}}$; *Input*, $I_{\mathcal{P}}$; *Storeput*, $S_{\mathcal{P}}$; *Fromput*, $F_{\mathcal{P}}$; and *Output*, $O_{\mathcal{P}}$. These properties are shown in the diagram below, indicating their relative position to each other and will be further explicated in another report concerning the feed-functions. In the figure below, the red outline indicates the system while everything "outside" the large red oval, but inside the larger blue rectangle, is the negasystem. The larger blue rectangle indicates the universe of the system and negasystem.



The –Put Properties

Toput, $\mathbf{T}\mathcal{P}(\mathbb{S})$, $=_{\text{df}}$ *Negasystem* components for which *system toput control qualifiers* are "true."

$$\mathbf{T}\mathcal{P}(\mathbb{S}) =_{\text{df}} \{x \mid x \in \mathbb{S}'_0 \wedge \exists P(x) \in {}_{\mathrm{T}\mathcal{P}}\mathscr{L}_{\mathrm{C}}\, [f(x)(\mathrm{T}\mathcal{P} \times {}_{\mathrm{T}\mathcal{P}}\mathscr{L}_{\mathrm{C}}) = \mathsf{T}]\}.$$

Toput is defined as the set of *negasystem* components and there exist toput control qualifiers such that there is a function from the product of the toput components and toput control qualifiers that is "true."

$\mathcal{M}$**: Toput measure,** $\mathcal{M}(\mathbf{T}\mathcal{P}(\mathbb{S}))$, $=_{\text{Df}}$ a measure of toput components.

$$\mathcal{M}(\mathbf{T}\mathcal{P}(\mathbb{S})) =_{\text{Df}} |\mathrm{T}\mathcal{P}(\mathbb{S})| \qquad (1)$$

$$\mathcal{M}(\mathbf{T}\mathcal{P}(\mathbb{S})) =_{\text{df}} \log_2(|\mathrm{T}\mathcal{P}(\mathbb{S})|) \div \log_2(|\mathbb{S}_0|) \qquad (2)$$

The choice of measure will depend on the application. Measure (1) is of value where the size of the toput set is required for comparison, say, to the input set; that is, a comparison of actual feedin is desired. Measure (2) is of value where a comparison to the system or between systems is desired that relates the amount of toput as a fraction or percentage of the total system.

Input, $\mathbf{I}\mathcal{P}(\mathbb{S})$, $=_{\text{df}}$ Resulting transmission of *toput* components; that is, system components for which *system input control qualifiers* of *toput* components are "true."

$$\mathbf{I}\mathcal{P}(\mathbb{S}) =_{\text{df}} \{x \mid x \in \mathbb{S}_0 \wedge \exists\sigma(\sigma(x_{\mathrm{T}\mathcal{P}} \in \mathrm{T}\mathcal{P}) = x_{\mathrm{I}\mathcal{P}})\}.$$

Input is defined as the set of *system* components for which there exists a system-transmission function that results in the transmission of the toput components to input components.

$\mathcal{M}$**: Input measure,** $\mathcal{M}(\mathbf{I}\mathcal{P}(\mathbb{S}))$, $=_{\text{Df}}$ a measure of input components.

$$\mathcal{M}(\mathbf{I}\mathcal{P}(\mathbb{S})) =_{\text{Df}} |\mathrm{I}\mathcal{P}(\mathbb{S})| \qquad (1)$$

$$\mathcal{M}(\mathbf{I}\mathcal{P}(\mathbb{S})) =_{\text{df}} \log_2(|\mathrm{I}\mathcal{P}(\mathbb{S})|) \div \log_2(|\mathbb{S}_0|) \qquad (2)$$

The choice of measure will depend on the application. Measure (1) is of value where the size of the input set is required for comparison, say, to the toput set; that is, a comparison of actual feedin is desired. Measure (2) is of value where a comparison to the system or between systems is desired that relates the amount of input as a fraction or percentage of the total system.

Storeput, $\mathbf{S}_{\mathcal{P}}(\mathbb{S}_{x})$**,** $=_{\text{df}}$ *System input components* for which *system fromput control qualifiers* are "false."

$$\mathbf{S}_{\mathcal{P}} =_{\text{df}} \{x \mid x \in \mathbb{S}_0 \wedge \exists \mathrm{P}(x) \in {}_{\mathrm{F}\mathcal{P}}\mathscr{L}_{C} \, \exists \sigma [f(x_{\mathrm{S}\mathcal{P}})(\mathrm{F}_{\mathcal{P}} \times {}_{\mathrm{F}\mathcal{P}}\mathscr{L}_{C}) = \bot \wedge \sigma(x_{\mathrm{I}\mathcal{P}} \in \mathrm{I}_{\mathcal{P}}) = x_{\mathrm{S}\mathcal{P}})]\}.$$

Storeput is defined as the resulting transmission of input components and there exists fromput control qualifiers such that there is a function of the product of fromput and fromput control qualifiers that are "false," and there is a transmission function from input components to storeput components.

$\mathcal{M}$**: Storeput measure,** $\mathcal{M}(\mathbf{S}_{\mathcal{P}}(\mathbb{S}_{x}))$, $=_{\text{Df}}$ a measure of storeput components.

$$\mathcal{M}(\mathbf{S}_{\mathcal{P}}(\mathbb{S}_{x})) =_{\text{Df}} |\mathrm{S}_{\mathcal{P}}(\mathbb{S}_{x})| \quad (1)$$

$$\mathcal{M}(\mathbf{S}_{\mathcal{P}}(\mathbb{S})) =_{\text{df}} \log_2(|\mathrm{S}_{\mathcal{P}}(\mathbb{S})|) \div \log_2(|\mathbb{S}_0|) \quad (2)$$

The choice of measure will depend on the application. Measure (1) is of value where the size of the storeput set is required for comparison, say, to the input set; that is, a comparison of actual feedstore is desired. Measure (2) is of value where a comparison to the system or between systems is desired that relates the amount of storeput as a fraction or percentage of the total system.

Fromput, $\mathbf{F}_{\mathcal{P}}(\mathbb{S})$, $=_{\text{df}}$ *system* components for which negasystem fromput control qualifiers are "true."

$$\mathrm{F}_{\mathcal{P}}(\mathbb{S}) =_{\text{df}} \{x \mid x \in \mathbb{S}_0 \wedge \exists \mathrm{P}(x) \in \mathscr{L}'_{C} \, [f(x)(\mathrm{F}_{\mathcal{P}} \times {}_{\mathrm{F}\mathcal{P}}\mathscr{L}'_{C}) = \top]\}.$$

Fromput is defined as the set of *system* components for which there exist negasystem control-qualifiers such that there is a function from the product of the fromput components and the negasystem control qualifiers that are "true."

$\mathcal{M}$**: Fromput measure,** $\mathcal{M}(\mathbf{F}_{\mathcal{P}}(\mathbb{S}))$, $=_{\text{Df}}$ a measure of fromput components.

$$\mathcal{M}(\mathbf{F}_{\mathcal{P}}(\mathbb{S})) =_{\text{df}} |\mathrm{F}_{\mathcal{P}}(\mathbb{S})| \quad (1)$$

$$\mathcal{M}(\mathbf{F}_{\mathcal{P}}(\mathbb{S})) =_{\text{df}} \log_2(|\mathrm{F}_{\mathcal{P}}(\mathbb{S})|) \div \log_2(|\mathbb{S}_0|) \quad (2)$$

The choice of measure will depend on the application. Measure (1) is of value where the size of the fromput set is required for comparison, say, to the output set; that is, a comparison of actual feedout is desired. Measure (2) is of value where a comparison to the system or between systems is desired that relates the amount of fromput as a fraction or percentage of the total system.

Output, $\mathbf{O}_{\mathcal{P}}(\mathbb{S})$, $=_{\text{df}}$ Resulting transmission of *fromput* components; that is, negasystem components for which *negasystem output-control qualifiers* of *fromput* components are "true."

$$\mathbf{O}_{\mathcal{P}}(\mathbb{S}) =_{\text{df}} \{x \mid x \in \mathbb{S}'_0 \wedge \exists\sigma(\sigma(x_{F\mathcal{P}} \in F_{\mathcal{P}}) = x_{O\mathcal{P}})\}.$$

Output is defined as the set of *negasystem* components for which there exists a system-transmission function that results in the transmission of the fromput components to output components.

$\mathcal{M}$: **Output measure,** $\mathcal{M}(\mathbf{O}_{\mathcal{P}}(\mathbb{S}))$, $=_{\text{Df}}$ a measure of output components.

$$\mathcal{M}(O_{\mathcal{P}}(\mathbb{S})) =_{\text{df}} |O_{\mathcal{P}}(\mathbb{S})| \qquad (1)$$

$$\mathcal{M}(O_{\mathcal{P}}(\mathbb{S})) =_{\text{df}} \log_2(|O_{\mathcal{P}}(\mathbb{S})|) \div \log_2(|\mathbb{S}_0|) \qquad (2)$$

The choice of measure will depend on the application. Measure (1) is of value where the size of the output set is required for comparison, say, to the fromput set; that is, a comparison of actual feedout is desired. Measure (2) is of value where a comparison to the system or between systems is desired that relates the amount of output as a fraction or percentage of the total system.