Structural System Property: *atis*Hierarchiness

(*Structural system properties* are those properties that are part of the theory and describe patterns of system and negasystem connectedness. The structural properties define the topology of the system, and every affect relation defines a topology on the system.)

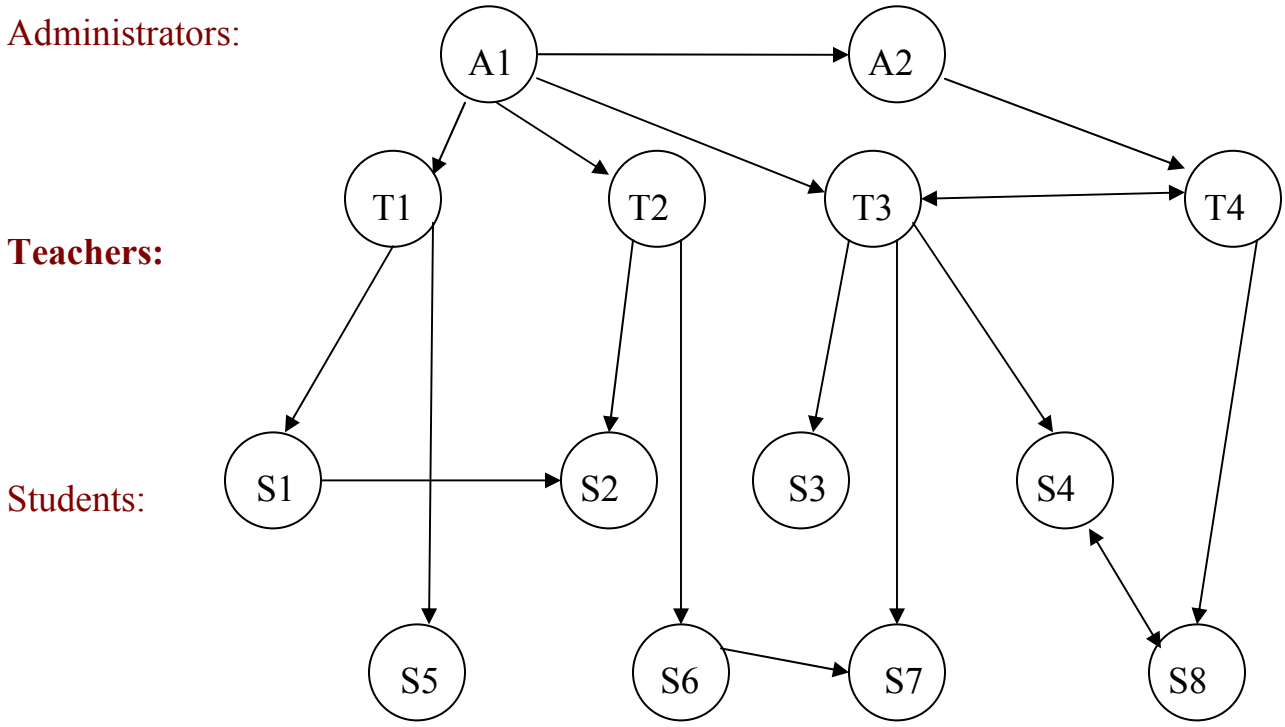
Hierarchiness, $_{HO}\mathfrak{S}$, $=_{df}$ a *partition*, $\mathcal{Y} = (V \subset \mathcal{G}_0, \mathcal{R} \subset \mathcal{G}_{\mathcal{A}})$, characterized by affect-relations that are a *tree-heterarchy*.

$$_{HO}\mathfrak{S} =_{df} \mathcal{Y} \mid \forall \mathfrak{e} \in \mathcal{Y}(\mathcal{R})[\mathfrak{e} \supset \mathcal{r}_{(tree)}(\mathfrak{e})]$$

$\mathcal{M}$**: Hierarchiness measure,** $\mathcal{M}(_{HO}\mathfrak{S})$, $=_{df}$ a measure of a *tree*.

$$\mathcal{M}(_{HO}\mathfrak{S}) =_{df} \{[\sum_{i=1,\ldots,n}(\sum_{j=1,\ldots,m}[|\mathcal{r}_{(tree)}(\mathfrak{e})| \times |\ell^{max}(\mathfrak{e}) + 1|]_j)_i] \div \mathbf{C}\} \times 100$$

Hierarchy-Relatedness in a School System



Affect Relation: *Controls Activities of*

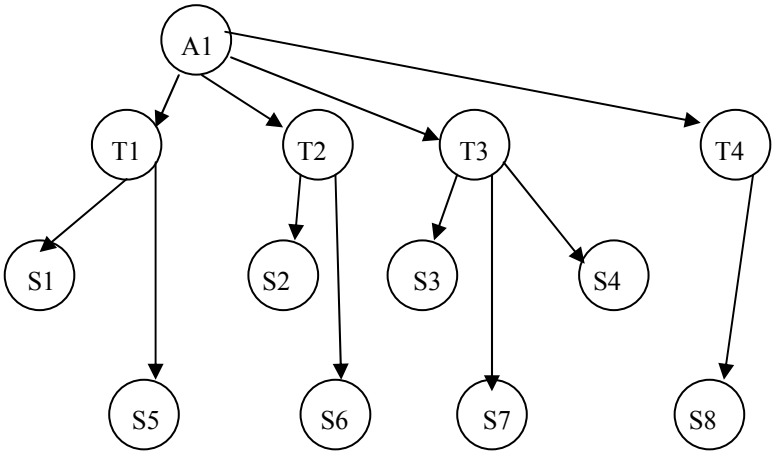
In this system, there are no components that *Controls Activities of* other components with respect to *Hierarchy-Relatedness*. Since there is only 1 affect-relation and 14 components, then the total possible affect relation paths is $\boldsymbol{P}[\mathcal{Z}(\mathfrak{S}_0)] = 236{,}975{,}181{,}590$; and therefore, $\mathbf{C} = \log_2(\boldsymbol{P}[\mathcal{Z}(\mathfrak{S}_0)]) \approx 37$. There are 0 paths related to *Hierarchy-Relatedness*. Although this system has a "root" that could indicate a hierarchy, there are no true levels of connection which are not otherwise connected as a heterarchy; that is there is no "tree" configuration. This structure is not a hierarchy. There are 0 paths related to *Hierarchy-Relatedness*. **Therefore:** $\mathcal{M}(_{\mathbf{HO}}\mathfrak{S}) = \mathbf{0.00}$.

Hierarchy-Relatedness in a School System

Administrators:

Teachers:

Students:



Affect Relation: *Controls Activities of*

In this system, there is 1 component that *Controls Activities of* other components with respect to *Hierarchy-Relatedness*; i.e., A1.

Since there are 13 components, then the total possible affect relation paths is $|\boldsymbol{P}[\mathcal{Z}(\mathfrak{S}_0)]| = 16{,}926{,}797{,}472$.

Therefore, $\log_2(|\boldsymbol{P}[\mathcal{Z}(\mathfrak{S}_0)]|) \approx 34 \approx 33.97859$.

There are 20 paths related to *Hierarchy-Relatedness*.

$C = [33.97859 \div 13] \times 100 = 261.37$.

Therefore, $\mathcal{M}(_{HO}S) = [(\Sigma_{i=1,\ldots,n}[(|r_{(branch)}(e) \geq 1| \times |\max(r_{(walk)}(e) + 1)|) \div 261.37 =$
$(20 \times 3) \div (261.37 \times 100 = 22.96.$

Therefore: $\mathcal{M}(_{HO}\mathfrak{S}) = 22.96.$