The Design Structure Matrix (DSM)

Tearing a DSM

Once a subset of coupled elements has been identified in a DSM (see **Sequencing the DSM** (https://dsmweborg.wordpress.com/sequencing-a-dsm/)), tearing is one way to attempt to determine a sequence for elements in this subset. Tearing is the process of choosing the set of feedback marks that, if removed from the matrix (and then the matrix is re-partitioned), will render the matrix upper-triangular. The marks that we remove from the matrix are called "tears".
Identifying those "tears" that result in an upper triangular matrix means that we have identified the set of assumptions that need to be made in order to start design process iterations when coupled tasks are encountered in the process. Having made these assumptions, no additional estimates need to be made.

No optimal method exists for tearing, but we recommend the use of two criteria when making tearing decisions:

- Minimal number of tears: the motivation behind this criterion is that tears represent an approximation or an initial guess to be used; we would rather reduce the number of these guesses used.

- Confine tears to the smallest blocks along the diagonal: the motivation behind this criterion is that if there are to be iterations within iterations (i.e. blocks within blocks), these inner iterations are done more often. Therefore, it is desirable to confine the inner iterations to a small number of tasks.

For further discussion on tearing, compare *Steward, D. V.: Systems Analysis and Management: Structure, Strategy and Design, Petrocelli Books, New York, 1981*.