



## Supplemental Notes for the July 21 INCOSE Activity

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A jigsaw puzzle begins as a complete picture then is cut into pieces you must reassemble. The IZZI puzzle used in this activity is a set of raw building blocks that can be combined in various ways to generate potentially millions of results. They *look* the same when you start, but must be solved in completely different ways. The difference originates in the reference against which “done” is determined.

In the case of the jigsaw puzzle, “done” is completely defined by the picture on the box. No creation whatsoever is required, only production labor. All of the pieces, and all of their interfaces, are pre-determined. Starting is hard, which is why people typically place the outer border first. Finishing gets easier with every piece you place, the last is easiest of all.

With the IZZI puzzle “done” is defined in terms of requirements, any solution satisfying those requirements is sufficient. The pieces are a given, but the interface solution able to create the desired outcome must be determined by the team. This is a messy, iterative process that starts easily but gets exponentially harder as the effort continues. The final piece is challenging.

What is critical to realize is that these are fundamentally different types of work. Pure repetition is great when someone else has done the design work for you, but what works well in that special case is fatal when you need to address creative and problem solving subsets of work.

All real work is a hybrid of fixed and variable elements. No single management approach will work well across that spectrum, the only way to move beyond mediocrity is to isolate and independently feed both types of work as part of a larger management system.

The ideal enterprise system needs to be able to manage fixed effort (production), create solutions on demand (design), and switch between those roles seamlessly. That adds the need to understand when to “lock” and “unlock” the creative freedom for any given system element.

Attempts to do this at a macro level (Stage Gate and others) are at best compromises. In reality every action people take is to some degree both fixed and variable in nature. Continuous management of these two dimensions is far more effective than periodic synchronization.

Note: By adding just a single requirement (that the outside border be solid black) the puzzle becomes hundreds of thousands of times more difficult to solve. Our ability to perceive the cumulative, interactive impact of requirements statements is often very weak, particularly when the system itself is poorly understood. There is a clear warning here for all those who engage in developmental work, either as a buyer or seller of services, to make sure that requirements are necessary, sufficient, and mutually compatible.