

Reuse Series, Mike Upah, August 2018

## Can a 'Live Search' Feature in CAD Enable Part Reuse

Live Search is a CAD software add-in that is intended to drive model and part reuse. A live-search application monitors a new model as it is being designed, and periodically searches to find any existing model that is so similar it can be reused as is, or with some small amount of modification, saving design time in either case.

### **Sounds like a good idea...**

After all, if an existing part can be reused, groups like Aberdeen estimate that \$5,000 to \$25,000 in design, prototyping, qualification, manufacturing and inventory costs can be avoided, and those figures don't include the cost of tooling or fixtures. With functional redundancy rates above 20% for the average industrial manufacturer, the cost of adding unnecessary new parts adds up to a very larger number. For example, if one hundred engineers produce twenty new models each year, and four are functionally redundant, at an average cost of \$10,000 each, the aggregate unnecessary expense would be \$4,000,000.

### **But can live-search deliver?**

Much depends on the technology the live-search application uses for matching. There are two approaches used by live-search applications to determine matches.

The first approach matches models by comparing a set of parameters such as surface-area, volume or moment of inertia. Obviously..., the first couple strokes of the mouse create so little detail that the live-search feature would only return relevant models by sheer luck. Because the parameters need to match very closely, it won't be until late in the design process that relevant matches will be found. And even then..., when a potentially reusable model is retrieved, what should be a cause for celebration quickly evolves into a new concern. At this point the designer, having put significant time and talent into their new model, may choose to ignore the reuse candidate and commit their new design as a finished part instead. While this is bad for the company, it may benefit the designer by having their name attached as the author of an additional model. In these situations the benefit of part reuse is lost, and the return on investment for the live-search application is diminished.

The second approach uses geometry as a basis for matching models. A geometric approach has a significant advantage not only in accuracy because it is working with a lot more data, but also because the search can focus on just the primary shape of the part and pay little or no attention to scale and small features. This allows relevant designs to be retrieved very early in the design process before any time is spent on careful dimensioning and feature development. Even if the retrieved model is the wrong size or lacks needed features, the awareness that similar parts exist incentivizes additional search.

## **ENABLING MANAGERS**

Because geometric-based approaches can score models for their degree of similarity with tremendous accuracy, all new models that have been committed to the CAD database can be listed in a New Models report for managers, with alerts for any models with high similarity to existing ones. The knowledge that managers will be alerted to missed reuse opportunities provides designers strong incentive to not ignore the live-search application when reuse candidates are presented.

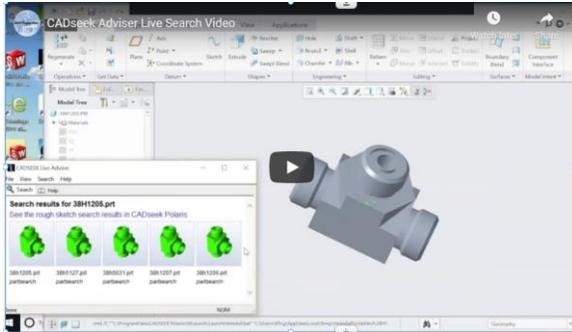
## **CADSEEK ADVISER LIVE-SEARCH**

CADSEEK Adviser is the only live-search application with the capability to use geometry as the basis to match models. Because Adviser can selectively focus on just the primary shape of the model, it can retrieve relevant reuse candidates very early in the design process before there is significant time and emotional investment in a new project.

And Adviser can be paired with CADSEEK Sentry, a new models report that alerts managers to reuse opportunities that might have been missed. This automation provides accountability for reuse, and gives managers the basis for rewards, reminders or even reprimands, which are key elements in building a reuse culture.



Please click the link below for a YouTube video demonstrating CADSEEK Advisor Live- Search in action in a real-world database of 20,000 models.



<http://www.youtube.com/watch?v=ecJSaSVNsc>

## SUMMARY

A live-search feature can certainly drive model and part reuse, but the efficiency of the live-search tool is a function of the technology that drives the matching process. Geometry-based technologies have both the accuracy needed to not distract designers with irrelevant models, and the ability to score the degree of similarity for meaningful alerts when a reuse opportunity might have been missed.