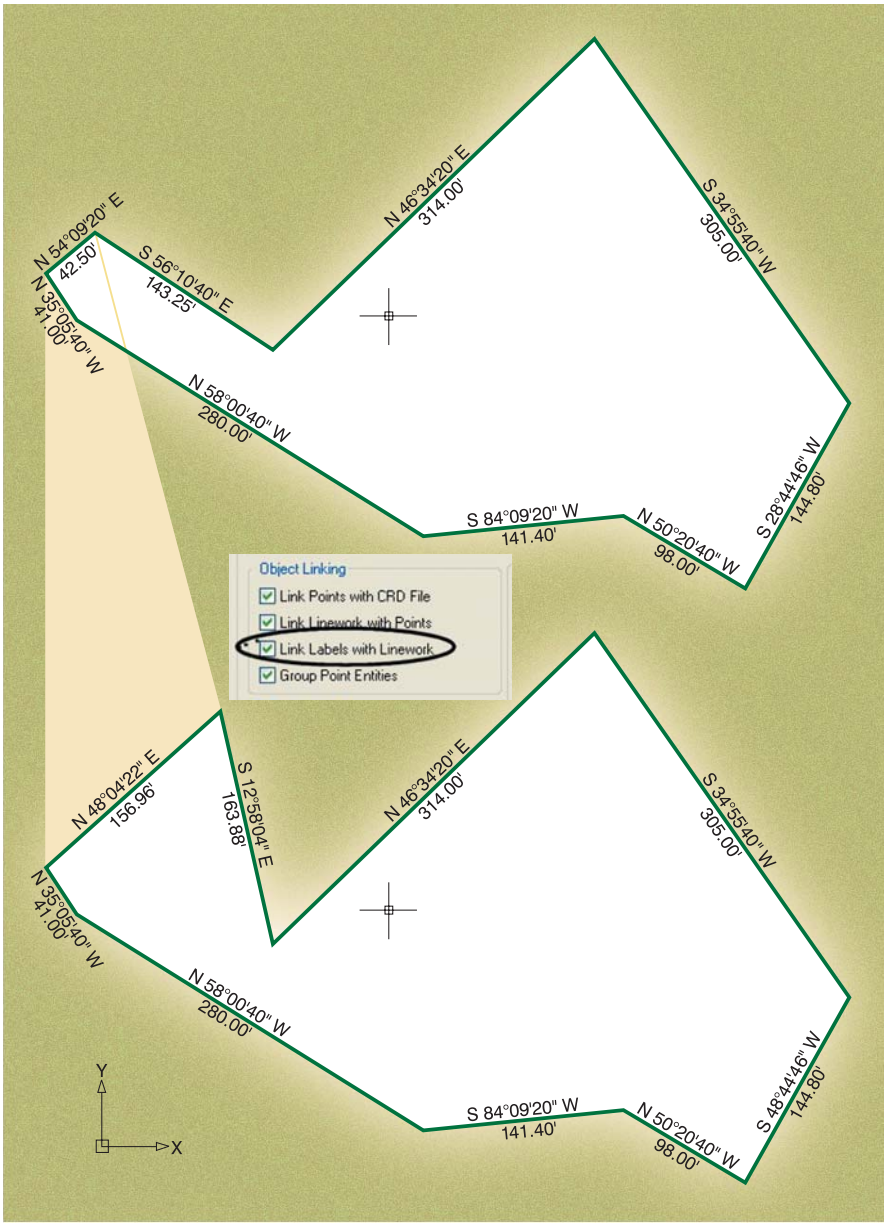

Parametrics

>> By Joseph W. Betit, LS

For 20 years I labored on the continent of INDUSTRY in the country of Surveying and came to speak and think like the natives in the practice of Reality. But lo, during one stormy passage between ports I was blown far across the sea and came ashore on the continent of ACADEME. I found the natives of Academe mightily distrustful of my strange language and ways. Here, Reality was not an outcome but a concept to be studied, analyzed and explained using theoretical models.

Eventually, I began to travel back and forth between these two continents. This meant dealing with perplexed natives wondering why one would not just stay in one or the other place. Over time I learned new ways through comparing and contrasting the ways of the natives of the two continents. In the process I came to see that I could make my way in the world by trading useful ideas between the two continents so I bought my own ship and named it *CONSULTANT* using a word from an ancient language meaning '*he who is not honored in his own land but walks on water everywhere else.*' On the bow I placed the emblem of the patron saint of surveyors, St. Rodney 'Can't get no respect' Dangerfield in honor of my origins.

Having recently left the continent of Academe and journeyed back to Industry (called 'Real World' by the natives on that side), I have had occasion to study, analyze and build a theoretical construct about something Industry calls *workflow*. Now, in truth, this idea of workflow is a very odd thing because the work actually staggers forward and back, left and right towards the objective rather than flowing. Even more oddly, workflow is spoken of in terms of 'efficient' but no one seems to finish the rest of the thought- - 'compared to what?.' I found that during my sojourn in Academe companies in the land of Industry have been splurging (yes, that is the right word and concept) on 'productivity tools' that improve the efficiency of workflow. Many are the computer systems linked together in awesome digital networks with everyone's work embedded together in immense CADD software packages and each discipline having their specialty CADD tools at their fingertips.

It would seem that with all these tools in Industry that surveying and engineering work should be performed much more quickly and with greatly enhanced cost effectiveness (*i.e.*, profit) than in my earlier days. It is true that many aspects of data collection and accuracy and many individual processes are vastly improved, but I do not see any real improvement in overall throughput of the projects from start to finish compared to prior years. How can it be that this is the case when so many of the processes have greatly improved and the tools we use are so much more powerful?

To answer questions such as this it is useful to borrow an idea from Academe.

In Systems Engineering there is a concept called 'outscoping' similar to what Industry terms 'thinking out of the box.' Sometimes this process of considering a system sufficiently removed from our own helps to get past habits of thinking that are obstacles to understanding how to improve our situation. In this case I have found it useful to compare the retail giant WalMart to its competitors.

In the beginning of WalMart growth they had hit upon the idea of replicating the effect of a small town downtown under one roof with the added benefit of climate control. They built mightily in rural and suburban areas and expanded greatly. WalMart encountered an increasingly difficult obstacle to profit, however. Many of the retail giants were positioned in urban areas or adjoining main trunk rail lines which made it efficient to service individual stores using centralized warehouses to feed the needs of the stores on a daily basis. Rural America is disbursed and relies on trucking, though, so WalMart found that it needed more and more, bigger and bigger warehouses with increasing numbers of trucks. Costs and coordination headaches just kept spiraling. Then someone, maybe an Academe or a Consultant, realized the problem of all these trucks was actually the solution if you used Toyota's 'Just In Time' perspective (remember, reality is just a concept for these folks).

What was the solution they had hit upon? The trailers inbound from the manufacturers and trailers outbound to the stores were the warehouses–mobile warehouses! Once this was realized then the former big box warehouses were converted to roofed, automated distribution and load shifting centers. Bulk cargo (trailers with only one type of cargo on board) came in on one side of the complex, were unloaded, separated into appropriate quantities and shifted over conveyors to be loaded unto store bound trucks carrying a variety of cargo.

This shift in methods required WalMart to use its purchasing clout to force the manufacturers to comply with WalMart requirements. Since no products were held inside the center it meant the manufacturers had to time the arrival of their mobile storage (trailers) to fit the WalMart outbound flow. The manufacturers soon found just in time techniques aggravating to implement but just as profitable for them as it was for WalMart.

WalMart discovered they now had real workflow instead of workstagger! There began decades of increasingly intense application of systems engineering (operations research and logistics) to improve and fine tune workflow efficiency. We know the outcome–WalMart is a global giant and its competitors are going bankrupt or merging–and copying WalMart's distribution system to survive.

The WalMart versus Other Retailers is very useful for understanding the surveying and engineering productivity dilemmas today. Underlying the WalMart systems approach is a concept called 'parametrics.' Parametrics is a complex critter, long applied in integrated circuit drafting. For our purposes it means simply 'rule driven' with the rules used to manipulate CADD data tied to the desired outcome. A simple example would be CADD output at different scales, on different size media on different plot devices.

We are all familiar with the headaches of going through endless check boxes in CADD to set up each plot combination for all these parameters and then storing the setting on a plot template in the software. A parametric system would not work like this. It would ask four questions: area to be displayed, preferred scale, paper size and plot device. The rules would then drive the software to rescale text, rearrange text to avoid overlap, etc., and then plot. The rules of cartographic design, legal requirements for minimum text and line size, legal wording content for submittal and company format are all well defined but they are seldom organized into rules to drive the software within our professional practice. This is because we have not taken in the importance and profound impact of the concepts underlying the march to dominance over an industry illustrated by a company such as WalMart. We are hesitant or unwilling to commit to all the consequences we instinctively realize such an approach would engender.

Most of us have experienced moving from one company to another and discovering that the new company uses pretty much the same hardware and software tools as our prior company. Yet, getting up to speed in the new environment is a major headache as you learn all the endless ins and outs of a system that grew organically by incorporating one 'good idea' after another. I am sure you too have often wondered whether you're hired for your professional knowledge or to experience the joys of learning the ways of your new company. For those who think a parametric approach might be worth investigating I offer this caution since current land design software does not fully embrace this concept. Rethinking company workflow in the form of parametrics tied to outcomes requires the full time effort of at least one person over a least the course of a year to get the process rolling. This is overhead, an unpleasant word in any for profit firm. Furthermore, once the process starts there will be many unintended consequences that will affect staffing, areas of responsibility and even elimination of entire workgroups. In addition, retraining becomes critical to implementation. On the other hand, if you want to be the dominant firm in your arena you are going to have to embrace this way of operating. The choice, of course, is yours.

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Joe Betit has a BS in Surveying and Photogrammetry, an MSc International Finance, and is currently in the doctoral program in Systems Engineering at The University of Virginia. He is employed by Davis, Bowen and Friedel, a multidisciplinary firm with offices in Salisbury, MD and Milford, DE. Joe and his wife Amy develop mentoring and leadership training programs, and he is an avid proponent and practitioner in the use of distance learning systems.