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Prototype Methodology:
Seeing is Believing

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PCA Business Notes Series

Prototyping is the modeling — and rapid remodeling — of the application User Interface, based upon Client feedback to PCA design, functional and workflow recommendations. Prototypes provide both PCA and our Clients with a simple, visual canvas to identify and agree on the best solutions to specific business needs.

PCA relies heavily on Prototypes to accomplish a number of important business objectives *early and inexpensively in the project*. The outcome of a properly executed Prototype Design phase results in:

- Confidence that we are on the right track

- A properly scoped project, with phases that are well-aligned with Client business needs and priorities

- Well-informed budget and schedule estimates

- Source-code to drive the Development Phase

Prototypes: Seeing is Believing

Much of the engineering effort that goes into developing a custom database solution is behind-the-scenes coding at the database level, thus not visible to Clients — nor very helpful with evaluating different approaches to meeting specific Client business needs.

To the contrary, the application User Interface is the "face" of the system, and is highly visible, referenceable and verifiable. Relying on the User Interface to facilitate the requirements gathering process is effective because Clients don't need to know anything about database engineering (or technology for that matter) to provide PCA with the information we need — the Prototype provides Clients with a simple, visual means to articulate their business needs, concerns and priorities, and PCA connects the dots.

The difference between talking database technology, or relying on the application user interface to facilitate Client-PCA communication is quite remarkable. By way of (real) example, if we were to observe a Client spending 2 weeks on average to identify and analyze gaps and overlaps within complex syndicated insurance policy layers, we might recommend a hierarchical SQL data structure that feeds a CLR calculation capable of generating policy gap and overlap data sets — and suggest that this approach has the potential to reduce policy analysis effort from 2 weeks to several hours, and with more reliable results. The engineering effort behind this recommendation might take several months to design, develop, test, refine and validate with the Client.

Alternatively, we might recommend a simple charting interface that allows users to interact with the underlying policy data in real-time, and visualize and evaluate policy coverage information on-the-fly. The engineering effort behind Prototyping this recommendation might take 2 or 3 days. Both of these approaches are in fact elements of the very same recommendation — they both must be developed to realize the business capability and benefit. Which recommendation do you think the Client is more likely to support: the technical approach that takes two months to build and validate, or the Prototype that takes a few days and can be visualized?

What is a Prototype?

A Prototype consists of two components: (1) the complete application User Interface — the main application layout, forms, buttons, lists, menu items, short-cuts, etc. — and (2) a SQL Server database schema design, which is the underlying data model (table structures and relationships) that drive the User Interface capabilities. Prototypes are the design shell of a new application, similar to the architectural drawing when designing a new house.

In fact, new home construction provides a very useful analogy. When you hire an architect to design a new home (or use an existing plan from a builder), you usually start with preliminary budget in mind. Of course there are lots of "options" i.e. different types of material and discretionary architectural features, some of which can impact the integrity of construction, and all of which impact the final cost.

Using an architectural drawing as a common reference, you and the architect work closely together to "keep this one, move this over here, remove that one, etc" — until you are satisfied with the results *and* the budget, and the architect is satisfied with the soundness of the architectural plan.

With 3D virtual tours of the architectural drawing, it is even possible to "experience" your new home design, and get a visual feel for what the new house would be like to live in, *before* construction begins and *before* you approve the budget. The benefit of this new virtual experience is the primary reason behind a new generation of fully-integrated "design-build" contractors who have emerged in the marketplace. Virtual prototyping instills confidence in the design, provides a meaningful preview of what's to come, and eliminates disconnects that can (and do) occur between separate design and construction phases.

Similarly, the PCA application Prototype is the shell of your new house. The façade, layout and structure are all visible, but the infrastructure necessary to turn the frame into a real home has yet to be built: no HVAC, no plumbing, no electricity, etc. Like home contractors, once a Prototype goes thru several design iterations and gains Client approval, PCA has sufficient information to estimate the effort required to build out the application infrastructure.

PCA will engage your team in design review / feedback sessions, and refine the Prototype based upon your continued feedback and preferences. Iterations to the Prototype designs are driven by a working Prototype application that is installed on your PC, and accompanied by a 'Paper Prototype' that you mark-up and send to PCA with your comments.

PCA Prototype designs reflect best User Interface practices that we have used successfully over the years to solve specific data management needs and streamline business functions. Prototypes may also include elements from your existing application.

How Much is the Application Going to Cost, and How Long Will it Take?

At the outset of a new project, we have the very same question! The Client-approved Prototype design helps PCA properly scope the project, and determine phases that are well-aligned with Client needs and priorities. The Client-approved Prototype design also helps PCA determine the level of engineering resources necessary to develop the application, and therefore supports well-informed budget and schedule estimates. PCA always updates our initial Project estimates based upon the results of the Client-approved Prototype design.

The Prototype Design phase can (and is intended to) be very fluid. Depending upon the Client's situation, needs and objectives, Prototypes can reflect a few minor changes from the status quo, or broad sweeping business process re-engineering changes. The degree to which the final Prototype estimate differs from our initial Project estimate is a function of the level and type of changes requested by the Client during the design Prototype phase.

Most Clients who approach PCA have a strong desire to manage their business more effectively and efficiently … to identify opportunities to eliminate waste, manual inefficiencies and errors from the business process, and to streamline workflows and improve overall usability. The Prototype provides the visual canvas upon which the best ideas are communicated and mutually supported.