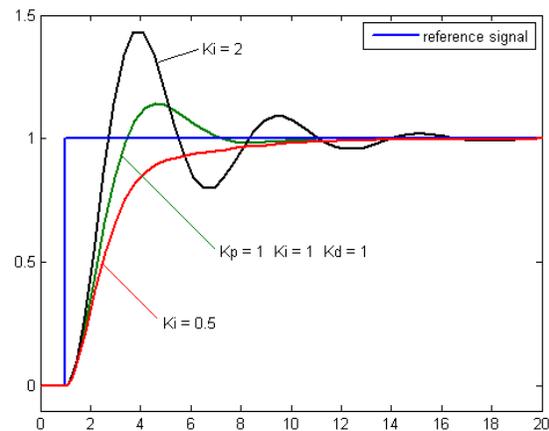


# The Hidden Power of the 'D' Factor

What are we really aiming at in Smart Buildings?

Iterative Intelligence - back in the late 80's thru early 90's I did an extensive study on PID control. The study was NOT centered on building control systems, but instead focused on the application of the PID (Proportional-Integral-Derivative) formula to the human model, i.e., self-adaptive, self-corrective control.

Even today, most building control programmers still only use PI, because the 'D' aspect is considered to be a bit too exotic, an unnecessary complication, an exercise in overkill. Yet, the 'D' is what finally removes the oscillation caused by the constant presence of bias and the constant - and in particular, the initial introduction of error. Without the 'D', there is still a great deal of unnecessary initial overshoot and droop around the initial approach to setpoint, and around significant changes to setpoint.



We typically measure human behavior against a set of variables, versus facility behavior that generally has a set of fixed setpoints. At first glance, it appears that applying PID to fixed setpoints is a much easier exercise than applying PID against variable setpoints. And, in a certain sense, it is. Or is it? What is the goal here? Too have 'good enough' control or to have superlative control?

When we accept P or PI as being good enough in a facility, then we accept P or PI as being good enough within ourselves. And when we accept P or PI as being good enough within ourselves, we are stating - unequivocally - that drift, bias and error are acceptable, especially 'initial' error. As a result, our approach to Smart Buildings has initial error built in, from the beginning. And we operate as if that's okay.

In human studies, the 'D' factor was very hard to master. It's elusive because we each have our own blind spots, spots that we often refuse to acknowledge exist. Our unacknowledged 'error'.

In my opinion, Smart Buildings will never be smart enough unless we start factoring in that we also need Smart People. Today's Smart Buildings are P or PI at best - because of initial error, including the relatively blind acceptance that initial error is not really even there.

Companies and investors typically shun the so-called 'soft' aspects that are staring them in the face (and mirror) both inside and outside of facilities everyday: human behavior. But Steve Jobs didn't. He built amazingly designed interfaces that automatically compensated for certain biases and errors that we all have. He changed the world by brilliantly and somewhat subtly introducing a form of PID control to particular forms of iterative human behavior. The D-effect spread into everything, almost overnight. It was a viral improvement. We were being self-corrected, and didn't even realize it. Who hasn't searched for the best app, and then searched again and again to find an even better one.

It's hidden in the power of the 'D'.

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