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Time to Change Platforms:

Part 1 – 'the proverbial frog in the pot of boiling water'

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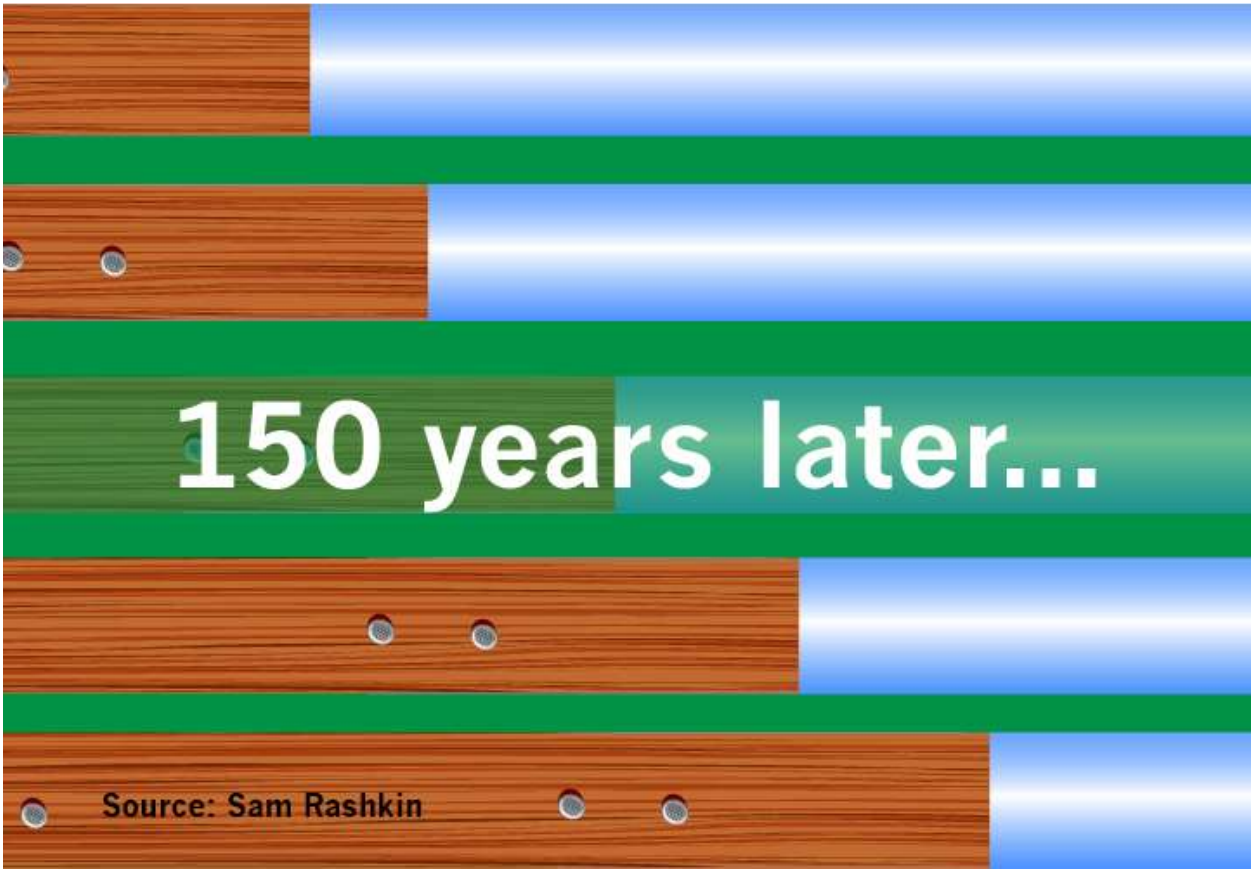

I did a little digging and found the picture in Figure 1 from a collection at Smithsonian Institution's National Archives,. It shows wood framing from almost 150 years ago. Compare this picture to Figure 2 showing a typical modern-day framed home. It is personally astounding to observe how little technology innovation is evident constructing our most significant consumer product, homes. The major home framing innovations that come to mind over the past two-hundred years are limited to western platform framing replacing balloon framing, board sheathing replacing plank sheathing, advanced framing connectors, nail-guns, and engineered lumber. Now

contrast this to technology innovation in the automobile industry over the past 100 years. Not very impressive. Yes, housing is an industry that truly holds onto established platforms.

The big question is, why such inertia in home building? With the best of intentions, I'll risk saying that the housing industry resembles that proverbial frog in a heated pot of water that fails to recognize its pending doom as the temperature gradually rises to boiling. It just keeps absorbing the gradual increase in pain. To demonstrate this concept, consider the pain faced by the building industry as it holds on to conventional wood framing.

For decades the quality of wood framing has gotten substantially worse. It's a growing challenge to find straight dimensional lumber without significant distortions. This creates a whole array of challenges with fit, finish, and trim along with homebuyer perceptions of poor quality when they observe construction. Engineered lumber where used helps, but it continues to get more expensive. This reduction in quality is further reflected in the continual decrease in compressive strength reported in dimensional lumber structural tables.

With the advent of more energy efficient assemblies (e.g., minimum code construction), wood framing has gotten more risky relative to moisture problems. This is because better insulated and air-sealed assemblies are more likely to get wet with colder surface temperatures below the dew point inside cavities, and they can no longer dry if they get wet due to substantially limited thermal flow. Meanwhile, diligent water management practices have been lax for decades (e.g., lack of kick-out flashing, pan flashing, drain tile wrapped in fabric filter).

In a related issue, wood framing entails significant work managing cracks, holes, and penetrations needed to comply with much more stringent code requirements for airtightness. There are thousands of pieces in the assemblies that lead to many inherently difficult air sealing challenges.

Wood framing has gotten more risky relative to termite damage. Part of this can be attributed to warming temperatures. I could care less about making a case for climate change, I'm just observing decades of data. And with warmer climates, the termite risk continually penetrates further north. Of particular interest is the Formosan termite. A colony of this voracious species eats 5,000 times more wood than a typical subterranean termite colony. Ouch! And the Formosan termites are rapidly moving north from the gulf coast states where they are having a profound impact.

Lastly, executive builders from all over the country attending Retooling the U.S. Housing industry workshops consistently bemoan the lack of quality trades, particularly wood framing, as one of their most significant business challenges. Further, the cost of wood framing subcontractors has been escalating dramatically in many markets.

At what point do builders take a serious look at their other options? And I don't mean comparing costs today between typical wood framing and innovative framing technologies? I'm talking about a comparison after inevitable learning curve cost reductions are achieved for new framing innovations that include what are often an impressive array of related cost savings and quality advantages.

The idea of changing platforms is such an important topic, I plan to devote the next five columns featuring builders and manufacturers from across the country who have successfully changed platforms from conventional wood framing. This will include a builder/manufacturer in Denver who has leveraged the substantial power of Building Information Modeling (BIM) along with advanced factory production to provide framing packages with substantial cost and quality advantages for those that just can't give up constructing with 'sticks'. It includes a builder from Texas who is so far down the learning curve with Structural Insulated Panels (SIPs), he is able to construct high-performance affordable homes that meet or beat his competitors' costs. It includes a builder/manufacturer from South Carolina who has a new SIP technology that doesn't use any wood and provides significant cost and

construction advantages. It includes one of the nation's largest home builders who is starting projects that will use Insulated Concrete Panel (ICP) technology that doesn't use any wood, is very energy efficient, and results in a highly resilient home. And lastly, it includes two manufacturers, one from California and one from New Hampshire, who are breaking all myths about modular construction and delivering a product that promises a transformative consumer experience.

So, for the next five months we'll take a detailed look at these framing innovations, the builder business case, and specific builders that successfully use them. Now take one more look at the home framing in Figure 1. 150 years is long enough for any production method.

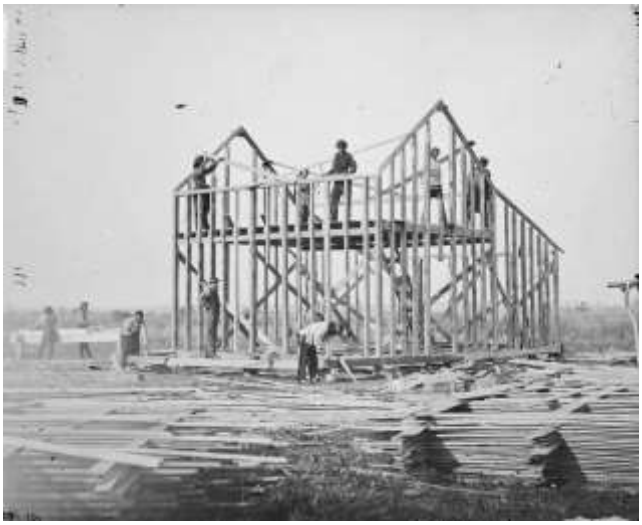

Figure 1: Ten men building a wood frame house on a Omaha Reservation in Nebraska in 1877
(Photo by William Henry Jackson: The National Archives, Smithsonian Institution)
Source: National Endowment for the Humanities, http://www.neh.gov/files/divisions/public/images/05_balloon-framing_resized.jpg

Figure 2: Typical wood frame structure from Architecture Curriculum at Magill University in Canada
Source: http://www.arch.mcgill.ca/prof/sijpkes/arch-struct-2008/SKIN-and-bones.html

This article is part of a series on housing innovation based on the author's book, ***'Retooling the U.S. Housing Industry: How It Got Here, Why It's Broken, and How to Fix It.'*** *This book examines opportunities to transform the homebuyer experience relative to five key components: 1) Sustainable Development, 2) Good Design, 3) High-Performance, 4) Quality Construction, and 5) Effective Sales. Each article features one innovation or business principle covered in workshops with builder executives. Find out how to participate in one of these workshops at www.SamRashkin.com.*