

# **The Next Generation of Clocks**

A Presentation by Bob Roan  
Santa Barbara Sculptor's Guild  
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I'm Bob Roan. Thanks for letting me talk with you.

These are examples of what you can do with the motors, lighting subsystems and digital clock movements I'm developing for creative people to use as design elements. They're called embedded systems because they consist of computers embedded in something.

Sculptors like you will be using embedded systems to reimagine everything from clocks, lights, shape, and color to presence, motion, tension and stability. They're a revolutionary new medium, one that can energetically engage the digital mindset of our medial age.

I'm farthest along embedding systems in clocks, so that's what I brought. My remarks tonight will mix clock specific examples with general comments about embedded systems and the digital imagination.

Nina's article described me as a non traditional sculptor. I'm not a sculptor at all, except metaphysically as a sculptor of ideas, algorithms and light. I work in the fields of computer hardware and software, space, time, timelessness, and alchemy.

I address you tonight as an agent of commerce with a great creative, meaningful and commercial opportunity for you. And for me, too. For us as partners.

It involves you putting embedded systems provided by me into your work. My strategy is to start with clocks, then move to lighting, motion, sound and other neat stuff.

I'm still developing the specifics of my plan and am looking for feedback to help me shape them. So please give me some at the end.

There was an article in the December 2007 issue of the Harvard Business Review about innovation. The authors looked at a number of companies' innovations and plotted each innovation on what they called a risk matrix: One dimension represents how new to the company the intended market is, and The other indicates how new the product or technology is.

The farther from the origin, the more major the innovation.

The article mentioned a study in which only 14% of the innovations were major, "big I" innovations, but they accounted for 61% of the profit. This is a statement both about our attitude toward risk and the role of major innovations as a source of real growth, opportunity, advantage and profit.

A companion piece about evaluating innovation listed six areas to consider, such as the reality of the market and the technology, your competitive strengths and strategy, and the potential advantages.

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This talk will take those ideas and apply them to embedded systems in art. My hope is to start you wondering about the importance of “big I” innovation in your art, whether you’re doing enough, and whether what I have to offer makes sense for you.

The world of technology is all around you and it’s only a matter of time before it permeates deeply into your work. So the question is not if, but when.

Most of you should consider establishing a strategic technology partnership with a vendor such as me. This is very common in businesses that want to focus on their core competencies instead of using large amounts of energy to keep up with changing technologies.

If you’re going to find a strategic partner, you need to make sure their strategy and capability fit your goals and needs. I have two “big I” innovation paths in the realms of clocks and lights that can help you get started with embedded systems and am developing more.

Let’s apply the methodology from that article, starting with the markets

Clocks and lights are good luxury markets: ubiquitous, profitable and fertile grounds for the kind of innovative thinking you can bring to them.

Time is nature’s heartbeat. Clocks go deep. People are always looking for tasteful, innovative and grounded gifts for themselves or others.

If you boil clocks down to their essence, there are two. One consists of two or three rotating hands in the center of a two dimensional surface. The other consists of 6 digits in something that looks like a clock radio. The first has been around for hundreds of years. The digital clock innovation happened 30 or 40 years ago. All innovation since then has served only precision and style.

Light has more psychological charge than anything except possibly sex.

We’re in an early stage of a transition from incandescent lights to LEDs. Our thinking about lights is understandably still analog. Drawing an analogy to the realm of music, our world view is similar to that which could have envisioned embedding a computer and motors into a turntable to enhance its stability. It was a good, solid incremental application for the time, but worlds away from the creative and commercial revolution of MP3, streaming video and digital players that would come later.

Like the turntable and the IPOD, the incandescent light is an analog device and the LED is a digital device. We won’t reach the real potential of LEDs until we learn to think digitally about them.

Embedded systems are definitely a “big I” innovation for most artists. An embedded system is a computer inside art, the way a computer is in a car or a telephone. It’s still a car or a telephone but very different. Embedded systems will spread deep and wide through sculpture, as they have many other fields.

It’s already started. How many of you have seen an art piece with changing LEDs or motion?

These digital clock movements represent an exciting new segment of the clock movement business that will provide software and hardware to people who are reinventing clocks the next step forward, back into their rightful place of wonder.

They're capable of supporting real artistic creativity, as you can see from what Max Neufeldt has done with them.

One of the advantages for you is that you don't have to master the computer programming or circuit board design, and can focus on developing and using them as an artistic medium.

Technology moves rapidly and there are many ways to get lost in something as major as a transition from analog to digital thinking. My strategic direction is grounded in Carl Jung's belief that alchemy is the metaphorical language of psyche. My medium is algorithms and my elements are air and water.

Time interests me as both science and mythology.

We live in the exactness myth.

At first, time was a story, and the sundial was a devotional to the gods of time. Now, time is a clock pulse, zipping between quantum states billions of times each second.

We've moved from a time with a beginning, middle and end that spanned the age of the universe to a clock pulse with a beginning, middle and end all crammed into a nanosecond.

I think about time by writing computer programs that poke and prod its image, broadly defined.

I'm trying to construct clock movements that speak the language of alchemy and can therefore communicate with psyche. These movements attempt the dialects of solutio and Sublimatio. I've taken a lot of a clock's characteristics and made them an option. For example, if clockwise, then also counter clockwise. Many such deconstructions yield thousands of possibilities, each one suggesting one solutio particle of an alchemically dissolved clock face and motion.

Sublimatio is a new image I'm developing in which the numbers float upward on the display, reminiscent of the alchemical procession of the elements into the air.

This may be the kind of big I innovation you should be involved with if you enjoy psychological and perceptual boundaries.

In time's transition from the industrial to medial ages, clock movement has been fractured. The way we think about location, number, display and synchronization has changed radically. Time's new home is the clock pulse while watches and clocks make the same moves they've been making for centuries.

The job of the clockmaker is changing dramatically. It used to be about holding something, either six LED digits or three tightly connected rotating hands. Now it's about creating an environment.

Think about the constraints that have driven the design of the clocks and lights you see. Then think about what you

could do if those constraints were loosened or removed.

Digital thinking lets you have as many displays of each type as you want and they don't have to be physically connected. You have complete freedom in three dimensions and unlimited materials of whatever size and shape you want instead of just 3 hands, which changes the clock from a box into an alchemical vessel and clock movement from a fixture into a solution.

That's a good place for a sculptor because you know how to work with three dimensions, can manage the tension and relationship between multiple elements and understand position, light, shadow, color and intensity. You know how to weave perceptions and will be able to liberate time from the clock pulse and turn it back into a story.

Embedding lights in your sculpture puts you in the lighting business. Have you ever wished your work was lit differently? Now the lighting can come with your work. You'll go from having no control over the lighting to having total control at all times. Not only that, but you can include multiple light schemes that shift the mood or emphasis.

This is important work.

Our relationship with time is in deep trouble and a new relationship is essential to our survival.

The root of the environmental and other world crises is the short sighted decision, a consequence of having lost sight of timelessness.

We're short sighted and need a new pair of glasses.

Clocks are the glasses we use to see into time. Our prescription has changed dramatically in the last fifty to a hundred years.

We need your energies, insight and dedication to reimagine that prescription or we may soon go blind to the eternities.

My business model is built around a partnership helping sculptors and other craftspeople use embedded computers. This is a "big I" innovation with the accompanying requirements of time, energy and resources. The strategic and creative payout can be very big if approached with a methodology similar to that in the article to which I referred. However, the resource drain can be equally big if you are not deliberate and cautious.

Welcome to the digital realm. You're going to need help navigating and that's what I offer. I hope that tonight I gave you a sense of what's coming, the creative opportunities involved and a structure for deciding how to mesh it with your own work.

My remarks tonight have been part reality, part under development and part planning. I will be grateful for honest feedback and suggestions of all sorts about how to best help artists like you with lights, motion, sound or other technologies.

If you know of any entrepreneurial artists or craftspeople, including yourself, who might be ready to consider the kind of "big I" innovation I've been discussing, please let me know.

Thank you