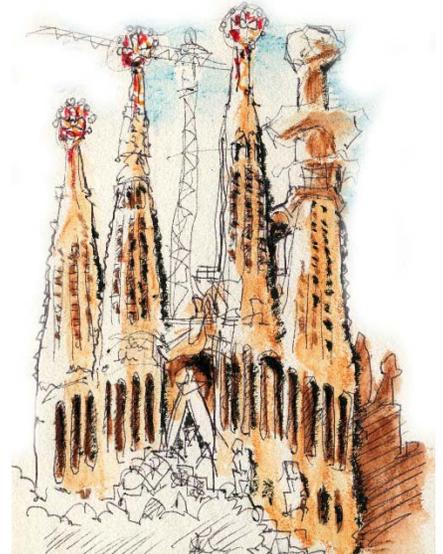


BUILDING AT THE SPEED OF MEDICAL INNOVATION™

Imagine working on a structure for 134 years and still having another 10 years of scheduled construction! If your building's function is rooted in religion, its value may never be diminished or lost; and perhaps the journey itself may be a spiritual one. The Sagrada Família is expected to be finished for the centennial of Architect Antoni Gaudi's death in 2026. This Barcelona Cathedral started construction in 1882 and was consecrated in 2010 giving it a head start on providing services to its parishioners – if one can imagine calling 128 years after groundbreaking a “head start”. History has recorded Gaudi's response to the exceptionally long schedule as: “My client is not in a hurry.”

By contrast, imagine that your cancer facility took only several years to fund, design and construct and, when completed, was only the third medical proton facility of its kind in the USA. One would think it was pretty special, but the facility closed in 2014, just 10 years from opening due to several factors leading to obsolescence.



How fast are you building opportunity?

We are at a crossroads in healthcare construction where the speed of medical innovation has outpaced the capability of conventional construction. Structures constructed using conventional methods cannot economically, easily or quickly be adapted to accommodate the latest therapeutic technology. The Indiana proton facility closed *during a boom* in the market largely because it was unable to remain competitive with the newer proton devices. Moreover, the building was a slave to obsolete technology. The radiation activation from the cyclotron means that multiple isotopes in the concrete may remain above legal clearance levels for radioactively contaminated materials for decades. What value is this structure now? And could they have seen this coming?

The traditional 50-year useful lifecycle of a building has been turned on its head. Medical science is moving

at the speed of Moore's law doubling every few years while central planners imagine structures will continue to function for at least half the life of a cathedral. Along with technology are changing demographics, populations and markets which can likewise lead to facility obsolescence.

If you are part of the radiotherapy or nuclear industry, you understand the role of physics in both equipment and structures. Many will recognize the name *Edward Teller*, a theoretical physicist who worked on the Manhattan Project and later became known as the father of the hydrogen bomb. He was one of the titans of nuclear physics along with Oppenheimer, Lawrence and Ulam.

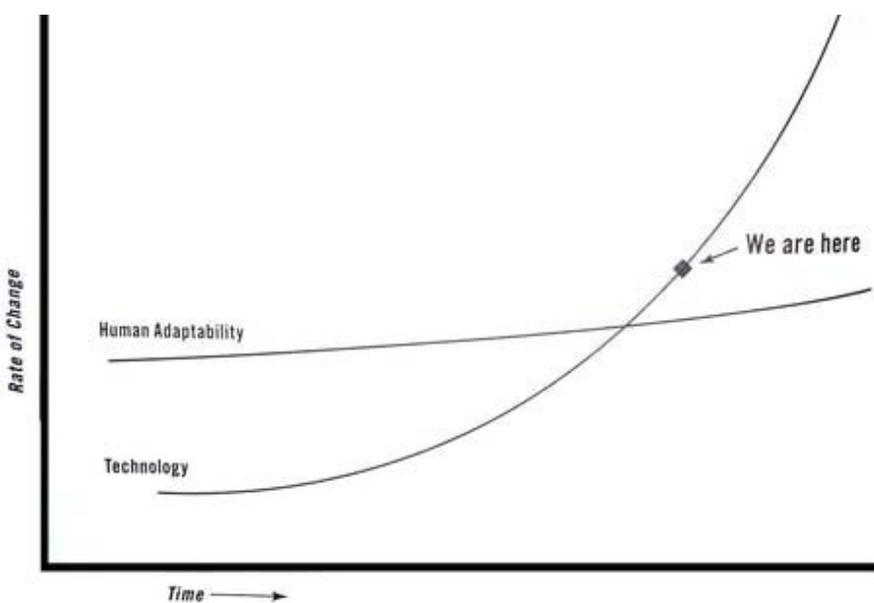
Today we have “Google X”, also known as the *Moonshot Factory*, which is the research and development subsidiary of Google focused on large scale changes and advancements rather than incremental, gradual changes. Their leader, “Captain of Moonshots”, is Astro Teller, the grandson of Edward Teller. He is a Stanford undergrad with a PhD in Artificial Intelligence from Carnegie Mellon University.

Astro Teller was interviewed by Thomas Friedman while writing his book, *Thank You for Being Late: An Optimist's Guide to Thriving in the Age of Accelerations*. The book, along with the Teller discussion, is an illustration of how *accelerating advancements* have outstripped man's ability to absorb and adapt. If you were born in the Middle Ages, 100 to 200 years had little impact on how you lived. At the turn of the last century, the time in which lives were impacted by technological advancement may have been reduced to a generation or two, roughly 30 years or more. Today, Teller claims, new technology emerges every 5 to 7 years that makes the world feel “uncomfortably changed”.

And if it takes society 15 years to adapt, govern and feel comfortable around new technology, there is a

gap between changing technology and our rate of accommodation. These shorter innovation cycles demand we take a new approach to challenges once solved by traditional methods.

“IF ACCELERATING TECHNOLOGY HAS ALREADY PASSED OUR ABILITY TO ADAPT,” LEFKUS ARGUES, “THEN SURELY IT HAS OUTGROWN THE FACILITIES THAT INHIBIT THEM. THE TELLER GRAPH SHOWS WHY NEW METHODS MUST BE USED TO ADAPT FASTER.”



Astro Teller's illustration featured in Friedman's book, *Thank You for Being Late*

“The time of static stability has passed us by”, Teller is quoted. “That does not mean we can't have a new kind of stability, but the new kind of stability has to be dynamic stability. There are some ways of being, like riding a bicycle, where you cannot stand still, but once you are moving it is actually easier. It is not our natural state. But humanity has to learn to exist in this state.”

So how does one apply “dynamic stability” to the construction of medical facilities? And perhaps, why should you? “We have to stop thinking in *cathedral time*,” states RAD Technology Medical Systems President, John Lefkus. “Speed to market and our ability to change have to be accelerated. Before concrete can cure, the next greatest solution may have already been introduced.”

Building a Better Way

We can start by looking at advanced therapeutic medical facilities in terms of 5 to 15-year business cycles. Longer than that, you are just betting against technology. Here is where the traditional brick and mortar approach falls short. The protracted time to market, the lack of flexibility in adopting new innovations and 50 year expected economic lifecycle make pouring concrete yesterday's technology. The "lock-in" to an unlikely 50-year lifecycle expectation is no longer tenable.

Institutional *modular construction* solves many of these challenges. The speed to market is often half the time or less versus traditional construction and it comes with key advantages. The modular structures, or parts of them, can be later removed, replaced or reconfigured with new modules catering to the latest technology. Perhaps more significant is that instead of using capital funds to invest in bricks and mortar, clients can simply rent or lease the solution for whatever period of time makes sense, often on par with the expected life of medical technology. This eliminates balance sheet impairment and capital challenges while providing increased revenue and capabilities.

"After 35 years in specialty institutional modular construction," Lefkus shares, "the superior quality of factory construction remains the industry's best secret. Anyone who has spent time in the field knows how weather and physical conditions can impact quality. It's not hard to imagine how a welder in a heated factory, working at a waste high jig, can perform better than one bundled in overalls on a 25 degree day working on a ladder with temporary lighting. With most adhesives and paints being water based today, the

extreme temperature and humidity conditions in the field wreak havoc on all types of finish operations. And no one would dig a foundation by hand today when we have modern excavators that do a better and faster job. The same holds true with factory construction where factory fabrication methods are simply superior to field solutions."

Modular factory construction, like many manufacturing technologies, will continue to see accelerated innovation and improvements over conventional site techniques. The precision of CNC and robotic manufacturing will continue to offer greater accuracy and speed.

A great illustration on just how *dynamic* a medical modular structure can be is the installation of a fully functioning radiotherapy facility over the course of one year produced by RAD. This structure houses a 10 MV linear accelerator generating x-rays up to 250 times the energy of most conventional diagnostic devices. Before you criticize the one-year time frame of being good, but not great, you need to know it was installed *three times* in three different cities spanning 2,400 miles over the course of that year. Starting in New Hampshire, and with a stop in Colorado's Vail Valley before going on to Idaho, the TRV was repeatedly erected in about 14 hours and made ready in only 5 days.

RAD TRV Cancer Facility



Installed and made ready in 100hrs.



305.898.2544 ■ www.radtechnology.com

Just the installation and commissioning of the average medical accelerator usually takes over 100 days and yet RAD provides pre-commissioned equipment and the *entire facility* in just over 100 hours. This is stability while

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moving and what dynamic innovation looks like. Without the use of an interim facility and equipment provided by RAD, cancer treatments for patients could be stalled for several months while institutions upgrade their equipment and perform renovations.

“Not content to merely match the old norms, I have sought out opportunities in my career as a modular builder where factory construction can *outperform* and achieve *superior* solutions over traditional construction,” states Lefkus. “Many of our clients, confronted with a choice between taking a chance on our modular approach or simply doing nothing, have recognized the value and witnessed the power and versatility of our approach.”

Accelerating advancements are served optimally by factory structures such as those deployed by RAD Technology. These solutions fit comfortably into the 5 to 7-year innovation cycles and bring *new* economic solutions that accompany the *new* technical ones. With the dawn of telemedicine, remote learning and online retailing, the current brick and mortar facilities that serve the outdated models will find it difficult, if not impossible, to repurpose themselves in the age of dynamic stability.

How fast are you building opportunity?

RAD Technology Medical Systems is a design-build construction company that provides revolutionary patented modular building systems for the healthcare industry complete with equipment and lease options that eliminate debt impairment and use of capital funds. These turn-key solutions are factory fabricated eliminating the need for lengthy on-site construction and can be temporary, interim or permanent. For more information, please visit www.radtechnology.com or contact RAD at 305-898-2544 or info@radtechnology.com.



RAD Technology Medical Systems, LLC ■ Aventura, FL ■ 305-898-2544 ■ www.radtechnology.com

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