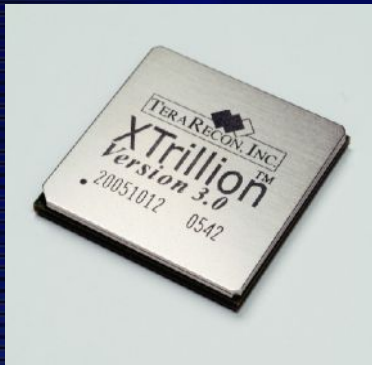


Global Innovation Ecosystem - International Conference Session 4

Innovating the Medical Industry through Technology Advancement

~ A Role Model for Applying Dedicated R&D for Vertical Industry ~

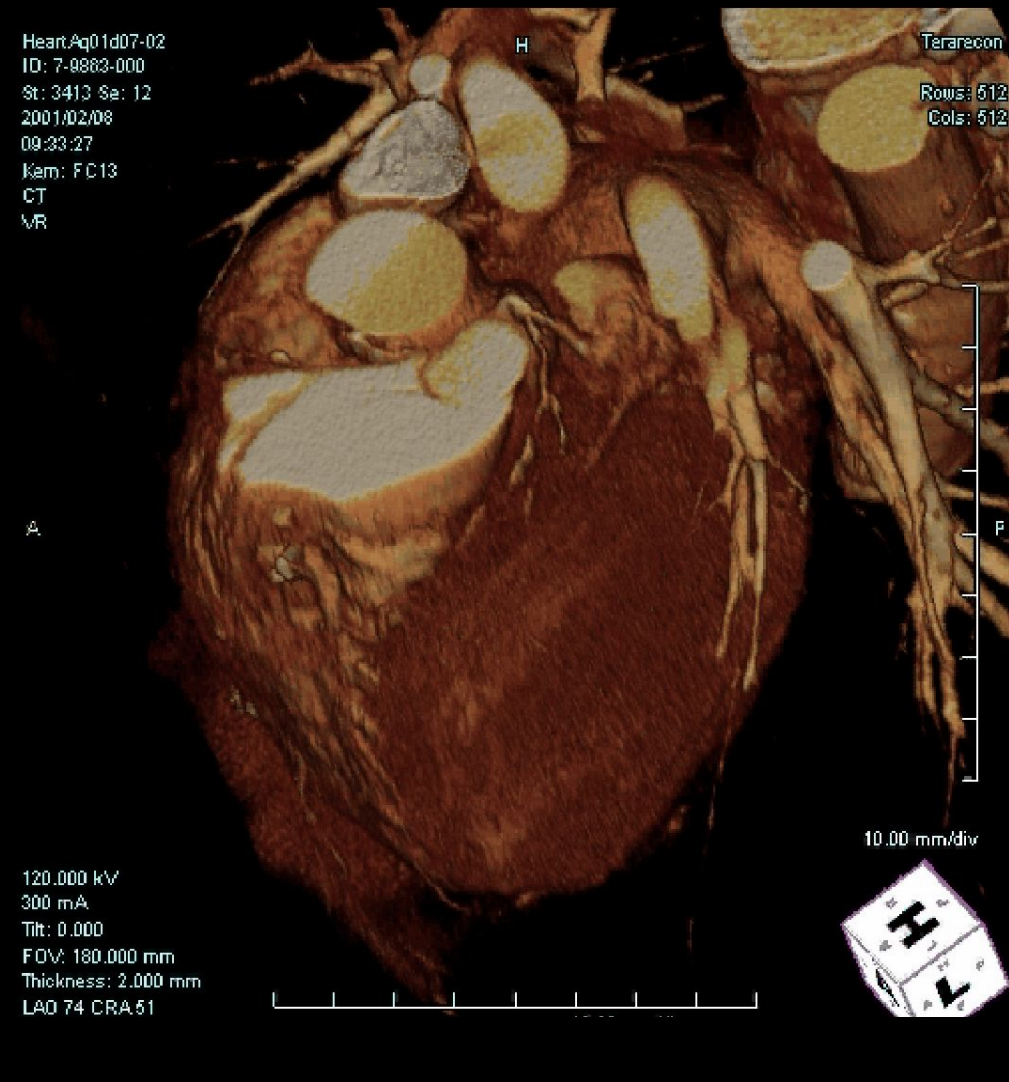


Motoaki Saito, M.D., Ph.D. (Japan)
President/CEO, TeraRecon, Inc.



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Necessity of the innovation in medical field

- The natural longing for the advancement in medicine even before the requirement from the society, government or the other industry
- The innovation in medicine will give the new lease of life, prolong the length of the work service and will be a social asset for the new growth
- The advancement in medicine should decrease the huge governmental or national medical expenditure, which would be used for the investment in the other industry
- It is apparent that the technology innovation is the one of the most important and efficient method to advance the medical industry



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The hurdles on technology innovation in medical field

- Unique, closed and highly professional aspect of the medical industry
- Fast speed of getting specific and complex in many direction
- Certification and Regulation hurdles for the outsider to do R&D or business
- There are not so many professional persons who can work in interdisciplinary area around the medical field
- It requires many years and huge investment in clinical validation
- Not so receptive for the new technology or new innovation, yet



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The case study of TeraRecon, Inc.

- Founded by the visionary radiologist with engineering background
- Inspired by the latest modality technology to invent the new application
- Understanding the technical requirement of new level of processing power
- Fund raising for the processor development
- Release of the proprietary processor as the only available dedicated processor for this big medical industry
- After getting enormous amount of processing power in the hand, it eliminated the technical limit of the imagination to invent new application or modality idea
- Follow on rounds of fund raising for further development of the technology, product and the business
- Self iteration of keep developing the technology and the business



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Background:

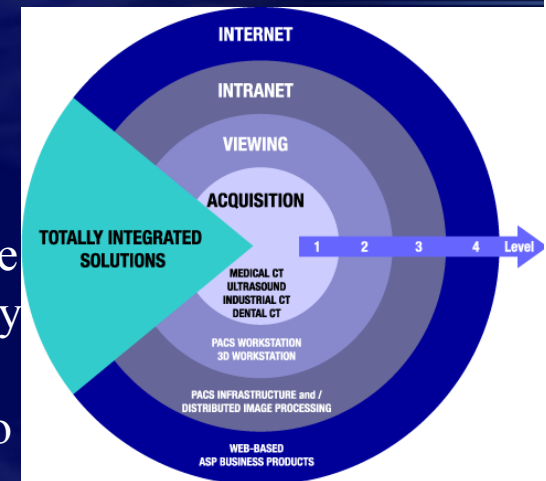
- Founded in 1997 as “medical application and solution driven” technology company by visionary radiologist after 3 years of basic R&D in Tokyo, Japan
- Specialized in medical field (device, imaging solution, OEM components, etc.)
- 260+ employees in 3 main offices (Silicon Valley, Boston, Tokyo), sharing its R&D, S&M, G&A resources

Characteristics:

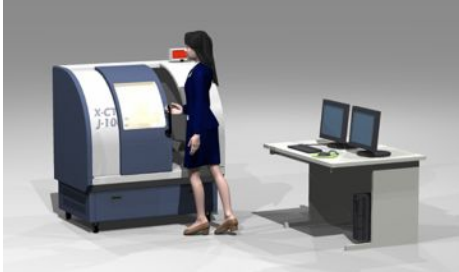
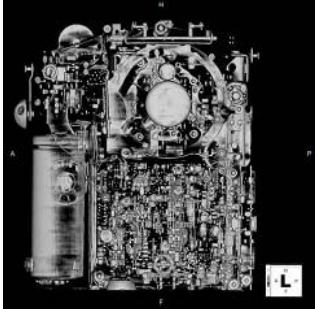
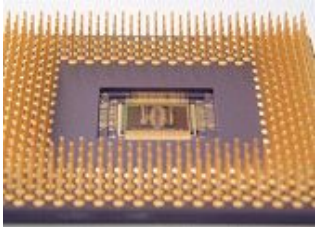
- Developed the proprietary processor technologies, “XTrillion HISC (Hierarchical Instruction Set Computer) processor” and “VolumePro VG processor”
- Sufficient in-house resources for entire hardware and software, digital and analogue development from processor level to large scale network system and solution level
- Developed broad and strong IP portfolio of enabling and disruptive technologies for medical device, application and solution

Strategy:

- Commit to all application layer and develop full sets of core technologies necessary in each layer
- Penetrating into layer by layer with good size of revenue
- Introducing fully integrated solution product, completely eliminating inter-layer barriers, in the end
- Providing the fastest, cheapest and most efficient way to manage medical data and image pathway with highest quality of the data and image for diagnosis and treatment



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Utilizing broad technology portfolio and condensed R&D resource ...

- Greatly improving today's modality, application and work flow
- Developing next generation modality and application
- Inventing whole new modality, application which will renovate or innovate on the existing data and work flow of clinical field

Outcome

- Add new value and unparalleled compelling power to the vendors
- Maximizing the end user (patient/medical professionals) benefit by improving the quality and speed of diagnosis and treatment

Technology/IP Portfolio

- More than 100 patents filed for broad application area, in different level (30+ patents issued in U.S.)
- The only real-time 3D volume rendering hardware platform (acquired business division from Mitsubishi Electric in 2001)
- Advanced 3D CT (Computed Tomography) technology
- Advanced 3D/4D visualization technology
- Real-time 4D processing, visualization and analysis technology
- The only 3D/4D processing server/client technology
- The densest (16ch.) DBF (digital beam former) chip for Ultrasound
- CdTe based direct conversion X-ray FPD (flat panel detector) technology
- Ultra-high resolution (48 mega-pixel) digital display technology
- Original real-time OS (operating system) for medical device



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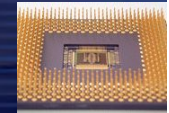
Invention of new application idea by the doctor with engineering background



Requirement for the new level of processing performance



Development of the proprietary processor



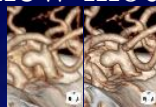
Development of the related hardware



Realization of the new application



The other invention of new application and new modality



Development of the proprietary system/OS



Development of the new application and new modality



Recreation of whole new proprietary processor, hardware and system



Inventing larger scale application and more advanced modality



Keep developing the new generation of processor, hardware and system



Keep inventing further applications and more advanced modalities



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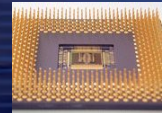
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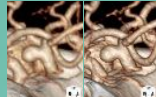
Realization of the new application



Development of the related hardware



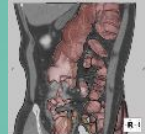
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Proposals for proceeding the technology innovation in medical field

- To induce just a few percent of medical school graduate into interdisciplinary field
- Priority admission of the student with engineering back ground
- Motivating medical professionals to communicate with other professionals
- To build up a practical system to encourage medical professionals to work in interdisciplinary area
- To frame a tax concession for the companies to work with medical professionals
- To promote the successful innovation model aggressively by the government



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Technology/Engineering Field

6,000+ /year doctors
newly certified in Japan

In Japan, more than 6,000 of
medical doctors graduate from
medical school and get certified
as clinical professional every year

Each doctor would uniquely and
specially contribute to thousands
of patients in his carrier life

Single
interdisciplinary
innovator

Thousands
of patients

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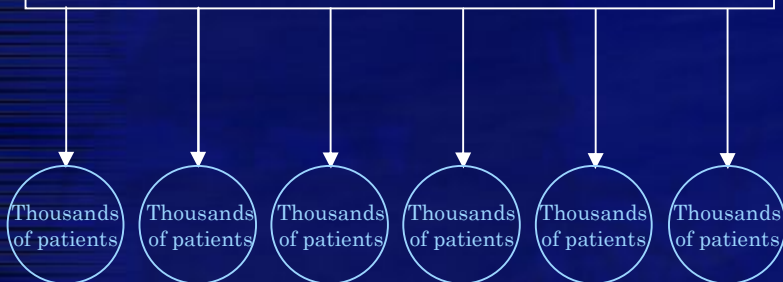
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6,000+ /year doctors
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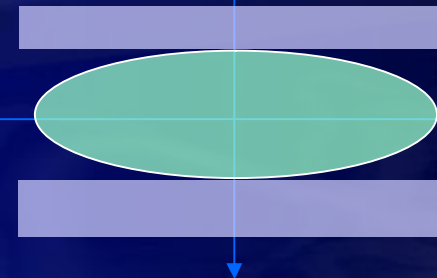
In Japan, more than 6,000 of medical doctors graduate from medical school and get certified as clinical professional every year

Each doctor would uniquely and specially contribute to thousands of patients in his carrier life



Technology/Engineering Field

Single interdisciplinary innovator



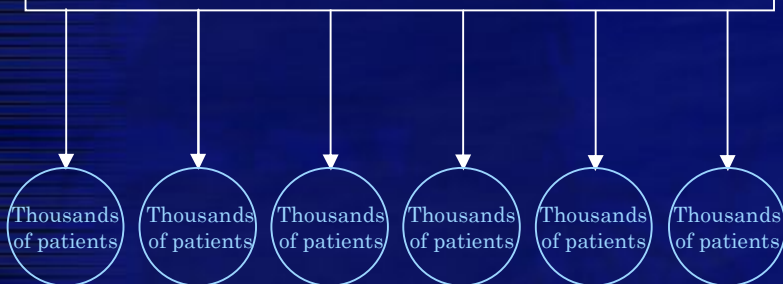
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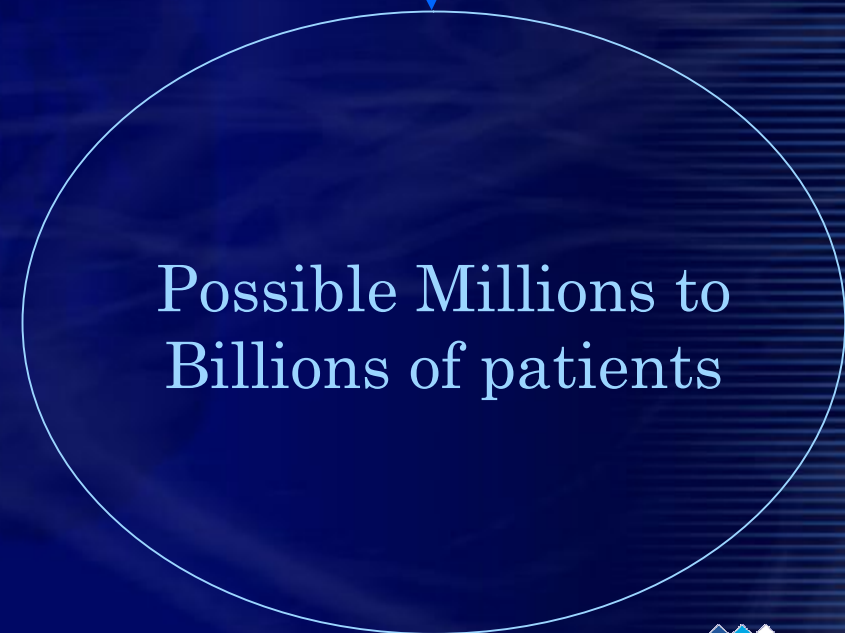
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