

The Innovator's Dilemma Resolved: Cosylab's metamorphosis from an innovator group to a high-tech champion

# From Successful Researcher To Successful Entrepreneur – A Personal Testimony

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## Purpose Of My Talk



- ❑ Motivate researchers to „cash-in“ on their achievements with an own company
  - And don't fear THE MISSING LINK BETWEEN INNOVATION AND COMPETITIVENESS
  
- ❑ Show by personal example that it can be done, even though it doesn't lead to a professorship
  - But you can still become president of the IJS, which isn't bad either 😊

## Why at the Italian Business Forum? **COSYLAB**

- ❑ My mother's family is from Trieste (Santa Barbara, actually)
- ❑ I worked 5 years at Sincrotrone Trieste (during design, construction and operation)
  
- ❑ Contributed to many links between Italy and Slovenia
  - Nearly built a Slovenian experimental station at Sincrotrone
  - Our company has invested in Italy: Joint-Venture with Sincrotrone
  - Built a production facility for this company in Sežana
  - Worked on the largest scientific ITA-SLO INTERREG project
    - Uni Nova Gorica, Sincrotrone, Cosylab, and a few others

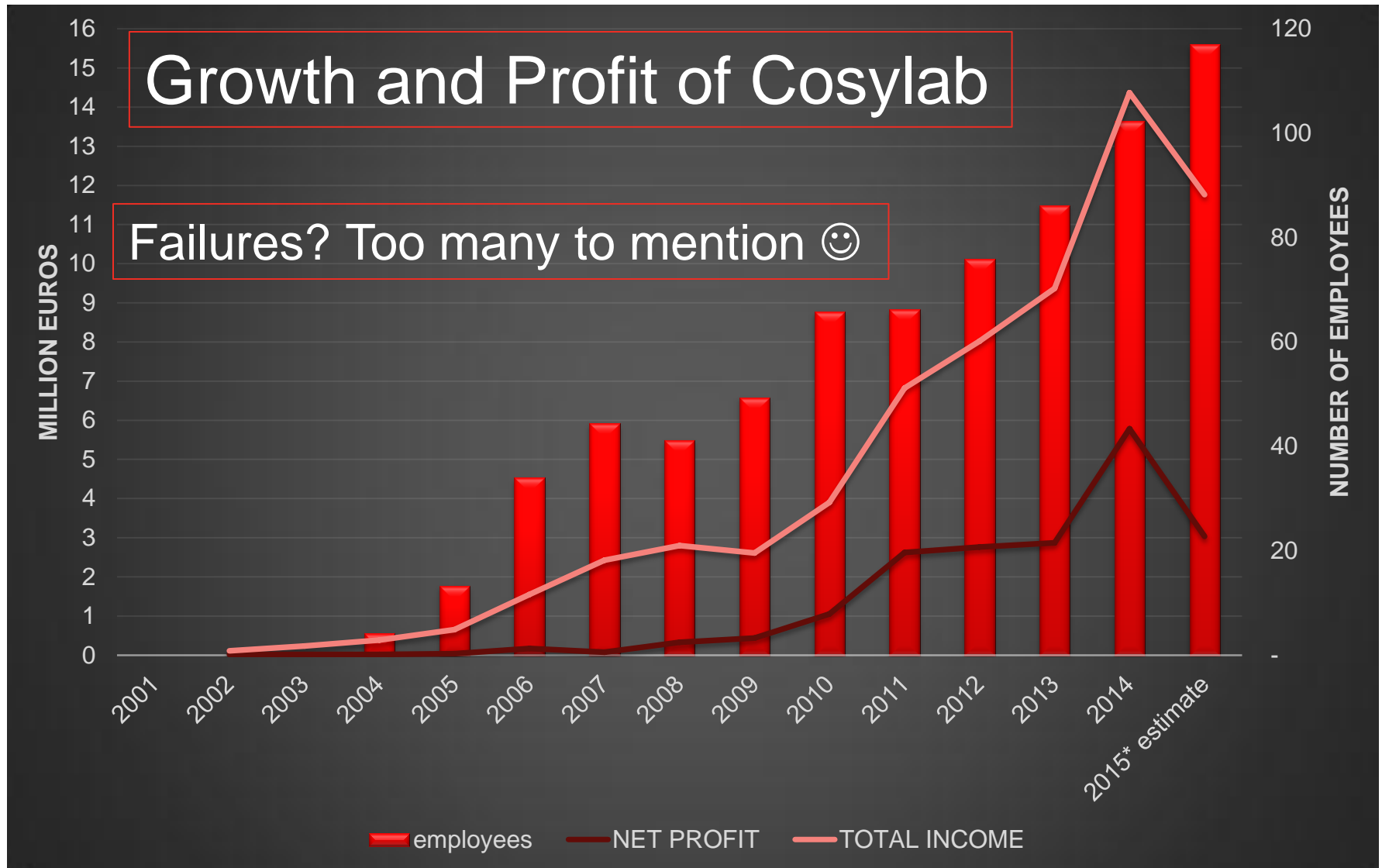
# Successful Researcher



Age	Achievement
21	University „Prešeren“ Award for Students
22	Employed at Uni LJ and IJS
25	PhD, result still plotted in latest Particle Data Book
28	Coauthor of over 100 articles, >1000 citations
28	Change from particle physics to accelerator physics
32	Coauthor of paper on novel accelerator design, to which all latest synchrotron light sources will be upgraded (yes, >20 years later)
40	European Physics Society Award
54 (now)	Back to IJS, as president of the council (i.e. science management)

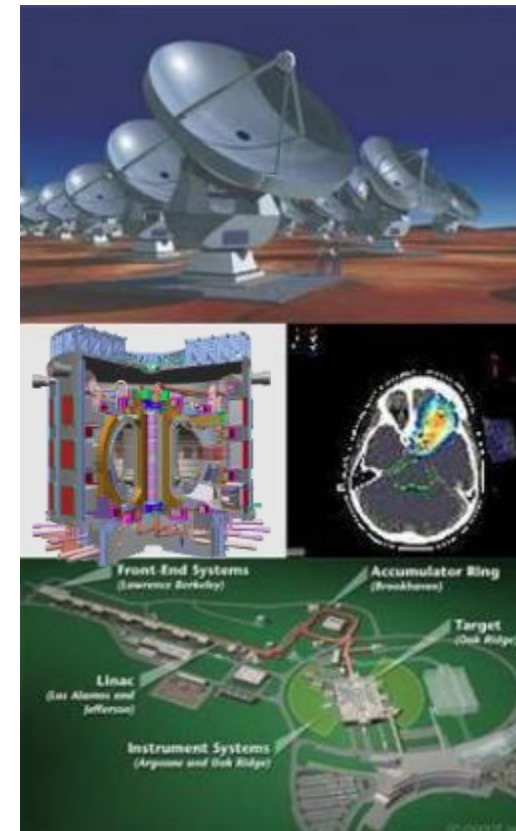
❑ Had my share of failures, too:

Age	Failure
31	Failed application for professor at Faculty of Electrotechnics
33	Failed to obtain 1M€ funds for Slovenian beamline at Elettra
34	Failed application for professor at Department of Physics



# Yeah, Right, But What Do You Actually DO?

- ❑ Cosylab is the leader worldwide for control system integration of nuclear accelerators and large physics facilities, chosen by the majority of projects
- We offer services and develop products where **expert knowledge** is required.
- We know how to use and develop **state-of-the-art electronics and software**.
- We **integrate** them into mankind's most complex systems.



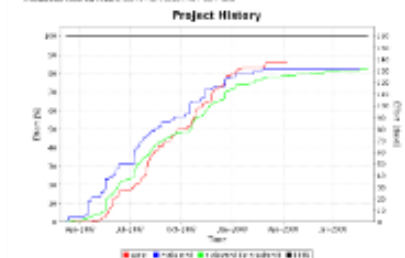
## 1.2 Time

### COSYLAB

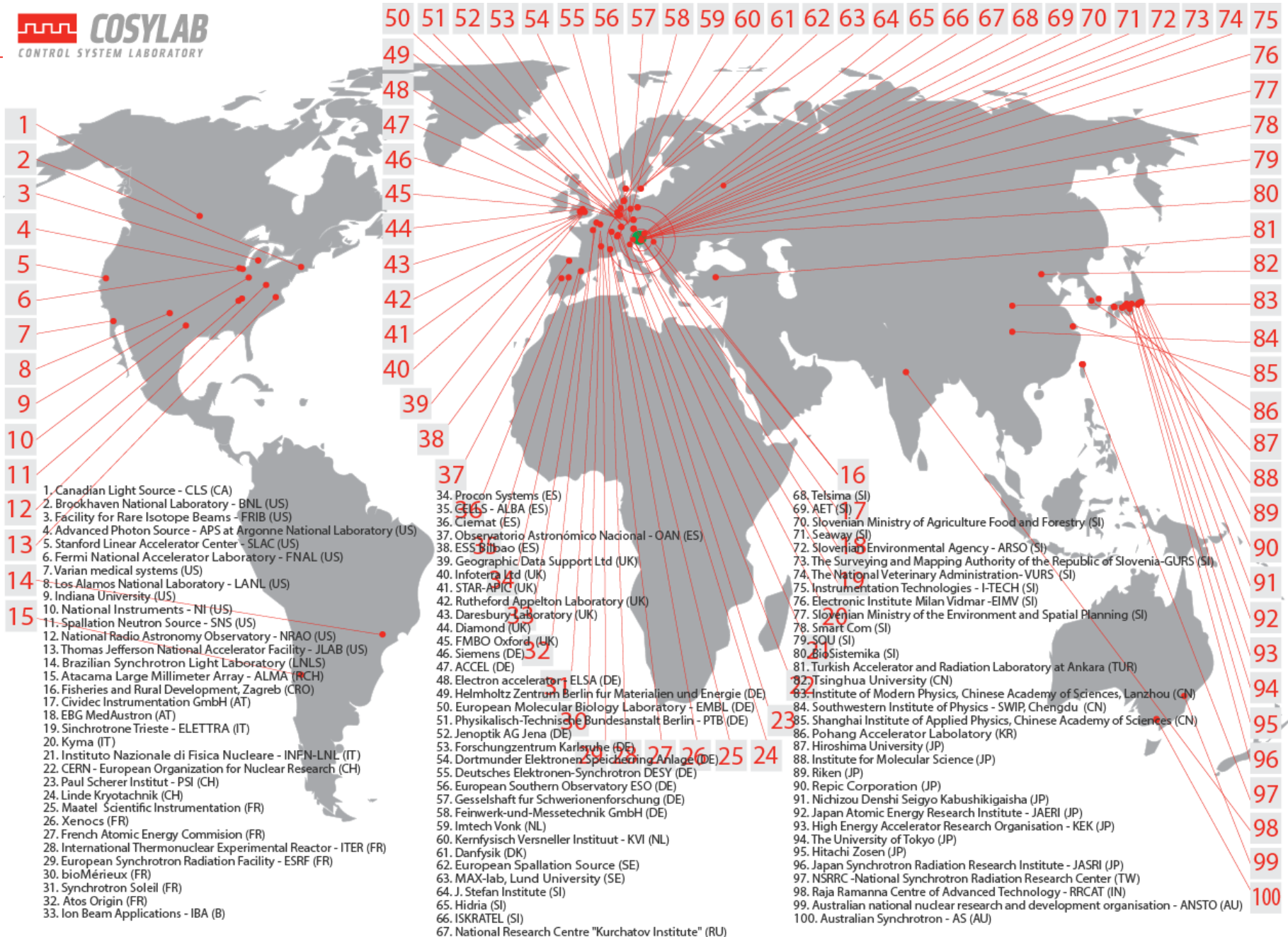
Project size: 100.00 mt - 75.00 mt - 5.00 mt  
 Time spent: 1.00 - 0.75 - 0.25  
 Two-part: 100% / 75% / 25%

100% 75% 25%

Accelerated time to finish: 1.00 mt - 0.75 mt - 0.25 mt



# Customers From Nearly All Major Labs Worldwide



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1. Canadian Light Source - CLS (CA)
2. Brookhaven National Laboratory - BNL (US)
3. Facility for Rare Isotope Beams - FRIB (US)
4. Advanced Photon Source - APS at Argonne National Laboratory (US)
5. Stanford Linear Accelerator Center - SLAC (US)
6. Fermi National Accelerator Laboratory - FNAL (US)
7. Varian medical systems (US)
8. Los Alamos National Laboratory - LANL (US)
9. Indiana University (US)
10. National Instruments - NI (US)
11. Spallation Neutron Source - SNS (US)
12. National Radio Astronomy Observatory - NRAO (US)
13. Thomas Jefferson National Accelerator Facility - JLAB (US)
14. Brazilian Synchrotron Light Laboratory (LNLS)
15. Atacama Large Millimeter Array - ALMA (CH)

16. Fisheries and Rural Development, Zagreb (CRO)
17. Civelec Instrumentation GmbH (AT)
18. EBG MedAustron (AT)
19. Sinchrotrone Trieste - ELETTRA (IT)
20. Kyma (IT)
21. Istituto Nazionale di Fisica Nucleare - INFN-LNL (IT)
22. CERN - European Organization for Nuclear Research (CH)
23. Paul Scherer Institut - PSI (CH)
24. Linde Kryotachnik (CH)
25. Maatel Scientific Instrumentation (FR)
26. Xenocs (FR)
27. French Atomic Energy Commission (FR)
28. International Thermonuclear Experimental Reactor - ITER (FR)
29. European Synchrotron Radiation Facility - ESRF (FR)
30. bioMérieux (FR)
31. Synchrotron Soleil (FR)
32. Atos Origin (FR)
33. Ion Beam Applications - IBA (B)
34. Procon Systems (ES)
35. CELLS - ALBA (ES)
36. Ciemat (ES)
37. Observatorio Astronómico Nacional - OAN (ES)
38. ESS - Sibiriao (ES)
39. Geographic Data Support Ltd (UK)
40. Infoterra Ltd (UK)
41. STAR-APC (UK)
42. Rutherford Appleton Laboratory (UK)
43. Daresbury Laboratory (UK)
44. Diamond (UK)
45. FMBO Oxford (UK)
46. Siemens (DE)
47. ACCEL (DE)
48. Electron accelerator ELSA (DE)
49. Helmholtz Zentrum Berlin für Materialien und Energie (DE)
50. European Molecular Biology Laboratory - EMBL (DE)
51. Physikalisch-Technische Bundesanstalt Berlin - PTB (DE)
52. Jenoptik AG Jena (DE)
53. Forschungszentrum Karlsruhe (DE)
54. Dortmunder Elektronen-Speicherring-Anlage (DE)
55. Deutsches Elektronen-Synchrotron DESY (DE)
56. European Southern Observatory ESO (DE)
57. Gesellschaft für Schwerionenforschung (DE)
58. Feinwerk-und-Messtechnik GmbH (DE)
59. Imtech Vonk (NL)
60. Kernfysisch Versneller Instituut - KVI (NL)
61. Danfysik (DK)
62. European Spallation Source (SE)
63. MAX-lab, Lund University (SE)
64. J. Stefan Institute (SI)
65. Hidria (SI)
66. ISKRATEL (SI)
67. National Research Centre "Kurchatov Institute" (RU)

68. Telsima (SI)
69. AET (SI)
70. Slovenian Ministry of Agriculture Food and Forestry (SI)
71. Seaway (SI)
72. Slovenian Environmental Agency - ARSO (SI)
73. The Surveying and Mapping Authority of the Republic of Slovenia-GURS (SI)
74. The National Veterinary Administration-VURS (SI)
75. Instrumentation Technologies - I-TECH (SI)
76. Electronic Institute Milan Vidmar -EIMV (SI)
77. Slovenian Ministry of the Environment and Spatial Planning (SI)
78. Smart Com (SI)
79. SQU (SI)
80. BioSistemika (SI)
81. Turkish Accelerator and Radiation Laboratory at Ankara (TUR)
82. Tsinghua University (CN)
83. Institute of Modern Physics, Chinese Academy of Sciences, Lanzhou (CN)
84. Southwestern Institute of Physics - SWIP, Chengdu (CN)
85. Shanghai Institute of Applied Physics, Chinese Academy of Sciences (CN)
86. Pohang Accelerator Laboratory (KR)
87. Hiroshima University (JP)
88. Institute for Molecular Science (JP)
89. Riken (JP)
90. Repic Corporation (JP)
91. Nichizou Denshi Seigyō Kabushikigaisha (JP)
92. Japan Atomic Energy Research Institute - JAERI (JP)
93. High Energy Accelerator Research Organisation - KEK (JP)
94. The University of Tokyo (JP)
95. Hitachi Zosen (JP)
96. Japan Synchrotron Radiation Research Institute - JASRI (JP)
97. NSRRRC - National Synchrotron Radiation Research Center (TW)
98. Raja Ramanna Centre of Advanced Technology - RRCAT (IN)
99. Australian national nuclear research and development organisation - ANSTO (AU)
100. Australian Synchrotron - AS (AU)

## 8 Who are we?

- ❑ 120 employees worldwide
  - >100 „developer/engineer“
  - Always ~30 students in the pipeline
- ❑ Branches: Sweden, USA, Japan, China, Switzerland





# Proton Therapy: Our Next Growth

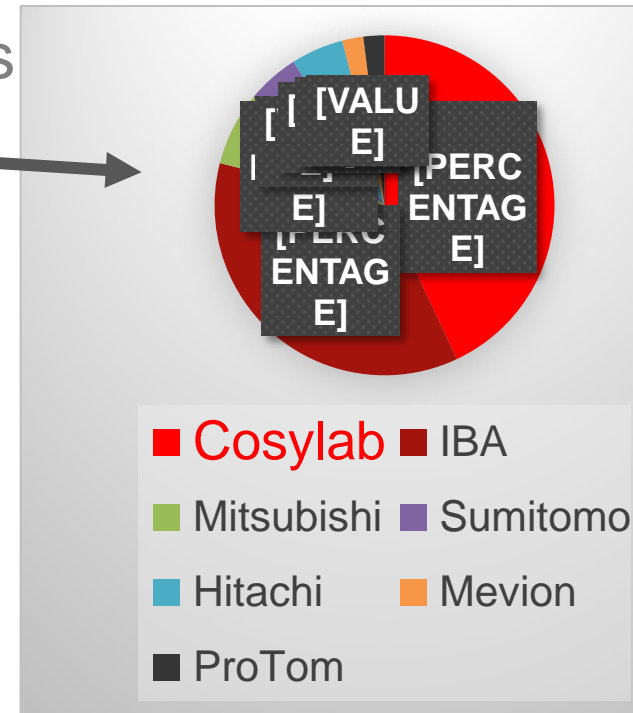


- ❑ Curing cancer with proton accelerators
- ❑ Cosylab already has **43% market share there in control systems**

- ❑ 20% growth - 1 billion EUR market by 2020
  - 40M€ yearly potential for Cosylab

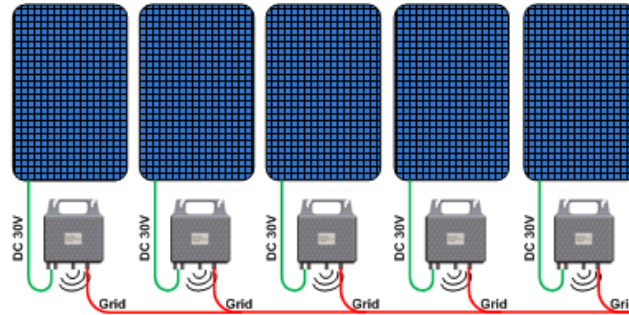
## ❑ GOALS:

- to become the Shimano or Bosch in this field
- **Let's build a commercial Proton Therapy Center in Slovenia**

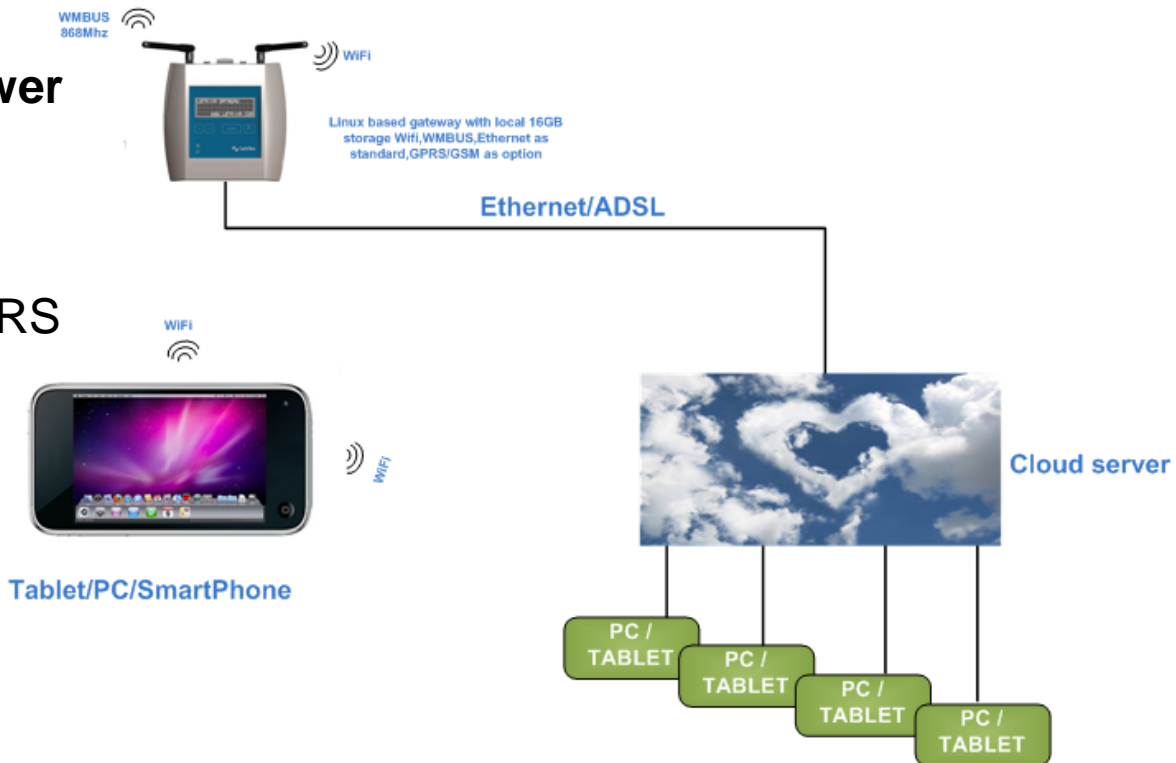


# Investing Outside Of Accelerators COSYLAB

## ❑ Joint-Venture Letrika Sol (Photovoltaic micro-inverter)



- **World's first: reactive power control !**
- Nominal power: 260 W
- Max efficiency: 96.1%
- WiFi, Ethernet and GSM/GPRS



# OK, How Did We Get There?



- ❑ Started without money, only verbally approved contract
  - had business idea – sell services to other researchers
  - had dedicated team – even if only students
  
- ❑ Strong (moral) support by IJS and the Technology Park
  - ATTENTION: nobody will do it for you!
  - But all help with advice, contacts, financial relieve, etc.
  
- ❑ An MBA from IEDC, Bled, helped a lot
  - If only for confidence that business is no harder than science, just different 😊
  
- ❑ Reinvented business model few times through adaptability & dedication when sales didn't get anywhere

## Honestly, We Also Had Plain Luck COSYLAB

- ❑ If you're good, you still need luck
  - Business books only prove competence and make heroes in retrospect
  
- ❑ The role of luck in business is important, but a good entrepreneur will try many times to improve the odds and grab luck when (s)he sees it
  
- ❑ Go where the business is, don't just sell your product
- ❑ What about the theory of core competences?
  - Definiton: that's where the business is 😊
  - But focusing on them once you understand them really improves your business

# Fine, But How Come We Knew Or Found Our Core Competence?



- ❑ One becomes an entrepreneur through work
  - A typical entrepreneur needs 10 years of experience in his/her field to understand what people need, what the competition doesn't offer and how the market/business functions
  - Hackers and software startups are the exception that proves the rule!
  
- ❑ You need self confidence and you get it when
  - You are competent in your field
  - you gain emotional intelligence
  - the environment accepts you and values you as you are

# What did we learn?



- ❑ **People are everything** (it took 30 years to figure it out!)
  - parents
  - Mentors/teachers (knowledge, ethics and first door openers)
  - Role models (learn from their mistakes – don't trust legends)
  - Co-workers (I'm just the frontman – “big mouth”)
  - The bosses I worked for
  - business mentors and friends
  - Even my enemies helped me a lot!
  
- ❑ **We compete with the whole world on equal footing**
  - Slovenians aren't less capable than Americans
  - Our schools and technical Universities are very good
    - There are better ones, but many more that are worse

# Conclusions



- ❑ Seek the objective truth and don't fall for "success stories" how successful people were more clever than others and did it over night.
- ❑ We have to understand the influence of luck and the use of hard work and the statistics of many attempts to minimise it.
- ❑ When it gets hard, remind yourself that success in life is that one is satisfied with oneself and the people one has relations with – it's not career, money or fame.

# THANK YOU!

**COSYLAB**

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