

APPENDIX A: Rules of the Leonardo da Vinci competition: “FOR THE MOST EFFICIENT SOLUTION IN PARTICLE DETECTION FOR EARLY CANCER DIAGNOSIS”

APPENDIX B: Tools and procedures developed by Crosetto with the help of his collaborators, targeted to assess and verify (relative to each research project), the existence of a link between the missing element claimed by the researcher in his proposed research and the final objective to be reached.

REFERENCES:

-
- [1] Links to documents related to the 3D-CBS innovative technology and to its impact in improving early cancer detection: www.crosettofoundation.org/uploads/399.pdf.
 - [2] Presentation of the Cancer Research Comparison Table reporting information of over 100,000 cancer projects funded for over \$37 Billion: <http://www.crosettofoundation.com/table.php?lang=en>.
 - [3] Rules of the Leonardo da Vinci competition. www.unitedtoendcancer.org/doc/2.pdf.
 - [4] Cancer: Dimension of the problem, <http://www.crosettofoundation.com/uploads/383.html>
 - [5] World Health Organization report <http://thechart.blogs.cnn.com/2010/06/02/who-predicts-21-million-annual-cancer-cases-by-2030/>
 - [6] Annual cancer cost per capita: <http://www.crosettofoundation.com/uploads/390.html>
 - [7] Direct medical expenses for cancer treatments increased 100 fold during the last 50 years <http://www.crosettofoundation.com/uploads/329.pdf>
 - [8] Meager results in the fight against cancer: <http://www.crosettofoundation.com/uploads/382.html>
 - [9] Report NCI: increased cancer mortality by 20% from 1975 to 2007 www.crosettofoundation.org/uploads/439.pdf
 - [10] Article about cancer mortality on The New York Times, April 24, 2009 http://www.nytimes.com/2009/04/24/health/policy/24cancer.html?_r=1&ref=fortyyearswar
 - [11] Article in FORTUNE Magazine, March 22, 2004: “Why we’re losing the war on cancer”: <http://www.crosettofoundation.com/uploads/229.pdf>
 - [12] Article in WIRED Magazine, December 22, 2008: “The truth about cancer. Don’t try to cure it. Just find it” - <http://www.crosettofoundation.com/uploads/231.pdf>
 - [13] The need for a paradigm change in oncology research. www.crosettofoundation.org/uploads/388.html.
 - [14] Form to be filled by every researcher who submits a cancer research project (and decision-maker who plans a service related to cancer). They must provide an estimate of the percentage of reduction of premature cancer death and an estimate of the percentage of reduction of cost for each life saved that they believe can be attained with their project. www.crosettofoundation.org/uploads/352.pdf
 - [15] Brief description of the signals generated by the mutation of normal into cancerous cells and how they can be detected. <http://www.crosettofoundation.com/uploads/258.pdf>
 - [16] Poster presented by Crosetto on 11/30/2010 at the Dallas Chamber of Commerce and in Houston on 12/04/2010 at the sixth Conference of the Italian Researchers in the World. Title: “HOW TO SOLVE THE PROBLEM OF CANCER AND REDUCE ITS ECONOMICAL BURDEN: Fund only research projects with real potential to reduce premature cancer death.” <http://www.crosettofoundation.com/uploads/410.pdf>.
 - [17] Leonardo da Vinci rules of the competition http://www.leonardodavinciprize.org/leonardo_da_vinci_prize.htm
 - [18] Thousands of people who signed the on-line petition supporting efficiency for implementing a paradigm change in cancer oncology to improve cost-benefit ratio: www.crosettofoundation.org/uploads/371.pdf
 - [19] Crosetto, D.: "Ignored Discovery Now Proven Capable of Saving Millions of Lives from Premature Cancer Death Demands Rethinking the Direction of Research" Book: Astroparticle, Particle and Space Physics, Detectors and Medical Physics Applications. Editor: World Scientific, pp.624-639 - 2008. <http://www.crosettofoundation.com/uploads/134.pdf>

-
- [20] Letter by SSC Director, also Director of FERMIlab www.crosettofoundation.org/uploads/102.pdf
- [21] Recognition of the value of Crosetto's basic invention in this field that he presented in 1992 within 35 days at three international conferences in Europe, Annecy and the U.S. Corpus Christi, TX, Orlando, FL, and he published in the prestigious scientific journals: Nuclear Instruments and Methods in Physics Research and IEEE-NSS-MIC. www.crosettofoundation.org/uploads/420.pdf
- [22] One page summary of the key innovations of the 3D-CBS technology. The key elements are in five main areas. Innovative electronics enables innovations in a different, simplified detector assembly, which in turn enables the innovations in the capability of executing complex real-time algorithms. Additional innovations, such as the ones that enable the use of more economical crystals that allow increased FOV keeping the entire device at a reasonable cost, can be achieved as a result of the combination of the previous innovations. www.crosettofoundation.org/uploads/254.pdf.
- [23] Technical-scientific book by Crosetto titled: "400+ times improved PET efficiency for lower-dose radiation, lower-cost cancer screening" published on June 30, 2000 – ISBN 0-9702897-0-7, available at Amazon.com and at www.crosettofoundation.org/uploads/431.pdf.
- [24] Crosetto, D.: "Development of an Innovative Three-Dimensional Complete Body Screening Device - 3D-CBS" Book: Astroparticle, Particle and Space Physics, Detectors and Medical Physics Applications. Editor: World Scientific, 2004, pp. 350-359. <http://www.crosettofoundation.com/uploads/103.pdf>
- [25] Crosetto, D.: "The 3-D Complete Body Screening (3D-CBS) Features and Implementation" IEEE-NSS-MIC-2003. Conference Record. M7-129. <http://www.crosettofoundation.com/uploads/107.pdf>
- [26] Crosetto, D.: Poster presented at IEEE-NSS-MIC-2003. Conference. <http://www.crosettofoundation.com/uploads/180.pdf>.
- [27] Original document reporting in detail how SSC Deputy Director implements directives from SSC Director John People, charging Andy Lanford to draft the charges to reviewers of Crosetto's 3D-Flow innovation. SSC would have to decide at which level Crosetto's invention should be supported during SSC close out. Lakford wrote such document and charged Joel Butler to organize an in depth review. Crosetto innovation was considered valuable and received maximum support during SSC close out to allow Crosetto to: "...complete the current development and leave the project in a state where it could be continued..." Crosetto non only documented his work but he also built, in part at his own expenses, the hardware proving feasibility of his innovative concept. However, after 18 years he did not receive funding to build a full system that would benefit HEP and later cancer patients. www.crosettofoundation.org/uploads/419.pdf.
- [28] Crosetto's innovative concepts for the First Level Trigger <http://www.crosettofoundation.com/uploads/291.pdf>
- [29] Charges to reviewers of Crosetto's 3D-Flow system invention. This review was requested by the Director of the Superconducting Super Collider (SSC) and held at Fermilab on December 14, 1993. www.crosettofoundation.org/uploads/423.pdf.
- [30] Photos from 38 to 56 relative to the original 3D-Flow documentation presented by Crosetto at the Fermilab review on December 14, 1993. www.crosettofoundation.org/uploads/422.pdf
- [31] Letter from the Head of the Computing Division at FERMIlab. www.crosettofoundation.org/uploads/440.pdf.
- [32] Testimonials and evaluations from experts in the field who have appreciated Crosetto's scientific approaches: www.crosettofoundation.org/uploads/167.pdf
- [33] Letter from CERN ECP Division Leader: www.crosettofoundation.org/uploads/179.pdf
- [34] Crosetto, D.: LHCb base-line level-0 trigger 3D-Flow implementation. Nuclear Instr. and Methods in Physics Research, Sec. A, vol. 436 (1999) pp. 341-385. Part 1 <http://www.crosettofoundation.com/uploads/147.pdf> Part 2 <http://www.crosettofoundation.com/uploads/148.pdf>
- [35] Questionnaire distributed at seminars (Pavia, BNL, etc.) or sent via email. The questionnaire was targeted to identify the most efficient and cost effective solution for first level trigger. www.crosettofoundation.org/uploads/418.pdf.
- [36] Press release announcing the award of the National Medal of Science by President Obama to Joanna Fowler http://www.bnl.gov/bnlweb/pubaf/pr/PR_display.asp?prID=1010&template=Today

-
- [37] Announcement of Crosetto's seminar at Brookhaven National Laboratory on September 24, 2009 and of the Workshop at the Policlinic San Matteo in Pavia (Italy) on September 30, 2009. This announcement was sent to about 50,000 scientists and decision makers in the field and Crosetto requested to make public both events (via web, EVO system and streaming) in order to be able to answer questions and clarify possible doubts or misinterpretations by anonymous reviewers that, after 17 years still confuse the 3D-Flow architecture with a "FIFO" (or hypercube) as it was understood by the anonymous reviewer appointed by BNL Associate Director to review one page of the 3D-Flow architecture provided by Crosetto. These misunderstandings from reviewers and decision makers delay and block funding, thus they prevent to transfer benefits from innovations to the bed of the patient. www.crosettofoundation.org/uploads/317.pdf
- [38] Links to the video recording of the Seminar by Crosetto at Brookhaven National Laboratory (Physics and Life science Departments) held on September 24, 2009, available at: www.crosettofoundation.org/uploads/441.pdf.
- [39] Advantages of the 3D-CBS innovative technology compared to current PET
www.crosettofoundation.org/uploads/311.pdf.
- [40] Press Release sent via BusinessWire and direct email announcing the international public scientific review of the 3D-CBS innovative technology that will be held in Dallas, TX on July 1, 2003.
www.crosettofoundation.org/uploads/122.pdf.
- [41] Agenda of the international public scientific review of the 3D-CBS innovative technology held in Dallas, TX on July 1, 2003. www.crosettofoundation.org/uploads/429.pdf.
- [42] Charges to the reviewers of the international public scientific review of the 3D-CBS innovative technology held in Dallas, TX on July 1, 2003. www.crosettofoundation.org/uploads/430.pdf.
- [43] Seminar by Crosetto presented on May 16, 2001, at the University of Geneva, Switzerland. Several scientists from CERN attended to the seminar. The initial version is available at:
<http://dpnc.unige.ch/seminaire/annonce.html>. The version revised on July 30, 2001 is available at:
www.crosettofoundation.org/uploads/100.pdf.
- [44] Copy of the slides presented by Crosetto at the international public scientific review of the 3D-CBS innovative technology held in Dallas, TX on July 1, 2003. www.crosettofoundation.org/uploads/432.pdf.
- [45] Crosetto, D.: "Rethinking Positron Emission Technology for Early Cancer Detection" Book: Astroparticle, Particle and Space Physics, Detectors and Medical Physics Applications. Editor: World Scientific, 2006, pp. 692-696. <http://www.crosettofoundation.com/uploads/112.pdf>
- [46] Crosetto, D.: "Funding 3D-CBS: changing the role of PET for cancer screening" Book: Astroparticle, Particle and Space Physics, Detectors and Medical Physics Applications. Editor: World Scientific, 2010, pp. 615-620. <http://www.crosettofoundation.com/uploads/331.pdf>
- [47] Crosetto, D.: Poster presented at the "Astroparticle, Particle and Space Physics, Detectors and Medical Physics Applications. 5-9 October 2009. <http://www.crosettofoundation.com/uploads/319.pdf>
- [48] Final report of the Review of the 3D-CBS innovative technology held in Dallas, TX on July 1, 2003
<http://www.crosettofoundation.com/uploads/101.pdf>
- [49] Links to the video recording of the international public scientific review of the 3D-CBS innovative technology held in Dallas on July 1, 2003 www.crosettofoundation.org/uploads/421.pdf.
- [50] Press Release sent via BusinessWire and direct email announcing the international public scientific review of the 3D-CBS innovative technology that will be held on June 23, 2008 in Rome, Italy.
www.crosettofoundation.org/uploads/199.pdf.
- [51] Agenda of the international public scientific review of the 3D-CBS innovative technology held on June 23, 2008 in Rome, Italy. www.crosettofoundation.org/uploads/200.pdf.
- [52] Charges to the reviewers at the international public scientific review of the 3D-CBS innovative technology that will be held on June 23, 2008 in Rome, Italy. www.crosettofoundation.org/uploads/202.pdf.
- [53] A copy of the slides presented by Crosetto at the international public scientific review of the 3D-CBS innovative technology that will be held on June 23, 2008 in Rome, Italy are available at:
www.crosettofoundation.org/uploads/433.pdf.

-
- [54] Links to the video recording of the international public scientific review of the 3D-CBS innovative technology held in Rome, Italy on June 23, 2008 www.crosettofoundation.org/uploads/424.pdf
- [55] Program of the international public scientific Workshop of the 3D-CBS innovative technology held on September 30, 2009 at the Scientific Directorate of the Policlinic San Matteo in Pavia, Italy. www.crosettofoundation.org/uploads/427.pdf.
- [56] A copy of the slides presented by Crosetto at the international public scientific Workshop of the 3D-CBS innovative technology held on September 30, 2009 at the Scientific Directorate of the Policlinic San Matteo in Pavia, Italy are available at: www.crosettofoundation.org/uploads/316.pdf.
- [57] Questionnaire submitted to the members of the panel at the Workshop in Pavia on September 30, 2009 and at Crosetto's seminar at BNL on September 24, 2009. www.crosettofoundation.org/uploads/418.pdf.
- [58] Links to the video recording of the international public scientific Workshop of the 3D-CBS innovative technology held on September 30, 2009 at the Scientific Directorate of the Policlinic San Matteo in Pavia, Italy are available at: www.crosettofoundation.org/uploads/426.pdf.
- [59] Program announcement of the International scientific public Workshop held on October 28, 2010 at the Department of Physics of the University of Pavia, Italy. www.crosettofoundation.org/uploads/428.pdf.
- [60] Report of SOME of the reasons why Crosetto's innovations were not funded and therefore an entire system could not be built. www.crosettofoundation.org/uploads/411.pdf.
- [61] Interview to Christian Joram who states that the Axial-PET is NOT a cancer research project. Yet the next day the Axial-Pet receives the first prize from CERN for the best cancer research project and the Association Madame curie assigns funding to it. Comparison: Axial-PET to 3D-CBS. <http://www.youtube.com/watch?v=iqWZ8G0gzBI>
- [62] A copy of the slides presented by Vigna at the international public scientific Workshop, held on October 28, 2010 at the Department of Physics of the University of Pavia, Italy are available at: www.crosettofoundation.org/uploads/434.pdf.
- [63] A copy of the slides presented by Crosetto at the international public scientific Workshop, held on October 28, 2010 at the Department of Physics of the University of Pavia, Italy are available at: www.crosettofoundation.org/uploads/414.pdf
- [64] Links to the video recording of the International public scientific Workshop of the comparison between the 3D-CBS innovative technology and the Axial-PET project, held on October 28, 2010 at the Department of Physics of the University of Pavia, Italy www.crosettofoundation.org/uploads/413.pdf
- [65] Crosetto, D.: Digital Signal Processing in high energy physics. Lecture before the CERN School of Computing at Yerermonde, Belgium 2-15 September 1990. Publ. by CERN 91-05. 14 May 1991. <http://www.crosettofoundation.com/uploads/227.pdf>.
- [66] Crosetto, D: "Logical Reasoning and Reasonable Answers Consistent with Declared Objectives for the Benefit of Mankind." International Seminars on Planetary emergencies 40th Session, Erice, 19-24 August 2008. Editor: World Scientific 2009, pp. 531-560. www.crosettofoundation.com/uploads/211.pdf
- [67] Video recording of Crosetto's seminar on August 23, 2008 at the International Seminars on Planetary emergencies 40th Session, Erice, 19-24 Agosto 2008 (before scientists and decision makers from all over the world, including a Nobel laureate in Physics). www.crosettofoundation.org/uploads/435.pdf.
- [68] Crosetto's seminar on May 7, 2008 to post-doc at the University of Texas Southwestern Medical Center of Dallas, TX. www.crosettofoundation.org/uploads/164.pdf.
- [69] Crosetto's seminar on January 14, 2008 to post-doc in Physics at the University of Pavia, Italy. www.crosettofoundation.org/uploads/165.pdf
- [70] Copy of the slide presentation by Crosetto on April 11, 2007 at the University of Pavia, Italy at the Institute of Human Anatomy. www.crosettofoundation.org/uploads/446.pdf
- [71] Video recording of the event held on April 11, 2007 at the University of Pavia, Italy at the Institute of Human Anatomy. www.crosettofoundation.org/uploads/447.pdf

-
- [72] Copy of the slide presentation by Crosetto on April 12, 2007 at the University Campus Bio-Medico in Rome, Italy. www.crosettofoundation.org/uploads/451.pdf
- [73] Video recording of the event held on April 12, 2007 at the University Campus Bio-Medico in Rome, Italy. www.crosettofoundation.org/uploads/451.pdf
- [74] Video recording of the public Conference-Debate by Crosetto on August 25, 2008 at the Istituto Nazionale Tumori Regina Elena of Rome, Italy. www.crosettofoundation.org/uploads/445.pdf
- [75] Video recording of the public Conference-Debate by Crosetto on August 29, 2008 at the Istituto Tumori of Milan, National Cancer Institute. www.crosettofoundation.org/uploads/443.pdf.
- [76] Video recording of the public Conference-Debate by Crosetto on September 4, 2008 at the Centro di Riferimento Oncologico, National Cancer Institute, Aviano, Italy. www.crosettofoundation.org/uploads/444.pdf
- [77] Video recording of the public Conference-Debate by Crosetto titled: CANCER: DIALOGUE FOR SCIENTIFIC TRUTH TO SAVE LIVES”, held on February 26, 2009 at the Province of Cuneo, sponsored by his President Honorable Raffaele Costa, Italy’s former Minister of Health. www.crosettofoundation.org/uploads/425.pdf.
- [78] Seminar by Crosetto on December 5, 2009 at the [Conference](#) “The contribution of Italian researchers in the world.” In Houston, TX. www.crosettofoundation.org/uploads/334.pdf.
- [79] Letter dated April 10, 2007 from Dario Crosetto to Dr. Elias Zerhouni, Director of National Institutes of Health. www.crosettofoundation.org/uploads/123.pdf.
- [80] Link to the video recording of the Press Conference on the “Future of Medical Imaging” held in Washington D.C. on January 31, 2006, when Crosetto asked questions and provided documentation to Zerhouni, Director of NIH. www.crosettofoundation.org/uploads/437.pdf.
- [81] Letter with the list of the documentation hand delivered on January 31, 2006 to Zerhouni, Director of NIH at the Press Conference on the “Future of Medical Imaging” held in Washington D.C. www.crosettofoundation.org/uploads/438.pdf.
- [82] Crosetto, D.: A modular VME or IBM PC based data acquisition system for multi-modality PET/CT scanners of different sizes and detector types. Presented at the IEEE Nuclear Science Symposium and Medical Imaging Conference, Lyon, France, 2000, IEEE-2000-563, <http://www.3d-computing.com/pb/ieee2000-563.pdf> or www.crosettofoundation.org/uploads/69.pdf.
- [83] Copy of the email correspondence of the review of Crosetto’s innovation by IEEE reviewer Les Rogers appointed by senior scientist Aaron Brill. The communication shows how Les Rogers’ viewpoint, based initially on preconceived concepts in particle detection changed toward understanding Crosetto’s innovation after over one month of email interaction between the two. http://www.3d-computing.com/pb/summary_nss99.pdf.
- [84] Photo of Crosetto’s first hardware prototype of the 3D-Flow system at the booth of the Industrial Exhibition area of the IEEE-NSS-MIC conference in San Diego (CA). www.crosettofoundation.org/uploads/442.pdf.
- [85] Drawings of Crosetto’s first hardware prototype of the 3D-Flow system at the booth of the Industrial Exhibition area of the IEEE-NSS-MIC conference in San Diego (CA). www.crosettofoundation.org/uploads/443.pdf.
- [86] Crosetto, D.: “3D-Flow DAQ IBM PC board for Photon Detection in PET and PET/CT” IEEE-NSS-MIC-2003. Conference Record. M3-130. <http://www.crosettofoundation.com/uploads/105.pdf>
- [87] 3D-Flow DAQ-DSP IBM PC board for photon detection with sixty-eight 3D-Flow processors. www.crosettofoundation.org/uploads/238.pdf.
- [88] Questionnaire filled out by ABO Project inspectors who reviewed the entire project for four days in Dallas, TX during 17 hours of meetings (all video recorded). They approved and witnessed the advantages of the system. www.crosettofoundation.org/uploads/162.pdf.
- [89] Proof of concept of Crosetto’s inventions <http://www.crosettofoundation.com/uploads/309.pdf>
- [90] See letter from experts from FERMIlab (Head of Computing Division) www.crosettofoundation.org/uploads/440.pdf and from CERN (ECP Division Leader) www.crosettofoundation.org/uploads/179.pdf stating that Crosetto’s invention is beneficial to other applications in addition to HEP.