ABSTRACT

Software products never grow old, or fade away. The designs, their patterns and the ideas embodied in them are carried over and over again for a long time. In this presentation we explore the venues of immortalizing the software systems and the intellectual components they are made up of. We argue that such indestructible systems must embody crucial application ideas and functions but also exemplify user oriented architectural forms that personify ease of use, crash free operations, and user maintainable and/or maintenance free within the specified constraints. We approach the issue by recognizing the implicit fact that a software malfunction is a disaster, however small it is. Based on our previous studies in disaster hardening systems, we apply the ideas used in preventing and mitigating disasters to the methods of designing and developing software systems. We show the mutual commonality as well as areas where methods used in one can be carried over effectively into the other.

We can treat the software system development as a ‘disaster-prone’ system. We consider a crash as an example of a disaster. We consider the minimum infra-structural requirements based on the application, and the operational and user environments. We review the strategies of disaster awareness, anticipation, proactive pre-emption, and precaution to prevent and/or mitigate the effects of the major or minor catastrophes.

We survey methods used in software quality improvements and show their applicability to activities in disaster mitigation and control. We illustrate these with examples using the CMM, Sigma Six and Taguchi- based ideas which show that mutual exchange of concepts enrich the important fields of software development and disaster control and mitigation.

We conclude by identifying the important overlap between the two areas of software development and disaster mitigation. The software change management and maintenance methods can greatly benefit by ideas from disaster technology. The software developed under damage and disaster control techniques can be robust, resilient and long lasting.
BIO:
Chittoor V Ramamoorthy has earned six degrees, two from the University of Madras, India in physics and technology respectively, two graduate degrees in mechanical engineering from the University of California, Berkeley, and two graduate degrees (A.M.& Ph.D) in electrical engineering and computer science (applied mathematics) from Harvard University (1964). His education at Harvard was supported by Honeywell Inc. with whom he was associated until 1967 as Senior Staff Scientist. He was among the three engineers under late Dr. Eachus to develop the first transistorized computer, Honeywell (H-290). He was a Professor of Electrical Engineering and Computer Science (1967-1972) and also served an interim period as Chairman of the Computer Sciences Dept. Since 1972, he has been a Professor of Computer Sciences and Electrical Engineering at the University of California, Berkeley and subsequently, Professor in the Graduate School and Professor Emeritus. His contributions have been in the areas of software engineering, distributed and parallel computation, and computer architecture. He has mentored 73 Ph.D. students. He has held the Control-Data Distinguished Professorship at the University of Minnesota, the Grace Hopper Chair at the U.S. Naval Postgraduate School, Visiting Research Professorships at University of Illinois, Urbana-Champaign and Northwestern University. He holds the Honorary Professorship at Asia University Taichung, Taiwan. He is a Senior Research Fellow of ICC Institute of the University of Texas, Austin.

He received the IEEE Computer Society’s the Group Award in Education for Curriculum Development, the Taylor Booth Award for outstanding contributions to education, the Richard Merwin Award for outstanding professional contributions, and its Golden Core Recognition. He received the IEEE’s Centennial Medal and the Millennium Medal. He received the IEEE Computer Society’s Hitachi-Kanai Award for 2001 for fundamental contributions in parallel and distributed computing, and the Best Paper Award in 1987. He was the Co-Winner of the IEEE’s Best Paper Award, the Donald Fink Prize paper Award, for 2003. He is a Life Fellow of the IEEE and a Fellow of the Society of Design and Process Science. From the latter, he received the R.T. Yeh Distinguished Achievement Award and in 2002, he received its Gold Medal of Honor. In 2006, it awarded its highest honor, the Herbert Simon Award. He served as the Founding Editor in Chief of the *IEEE Transactions on Knowledge and Data Engineering* and served as the Editor in Chief of the *IEEE Transactions on Software Engineering*. He was the founding Co-Editor in Chief of the *International Journal of Design and Process Sciences*, and the *International Journal of Systems Integration*.

He was elected and served as the First Vice-President, the very first V.P for Education, and Governing Board Member in the IEEE Computer Society. He was a Founding Director of the International Institute of Systems Integration in Campinas, Brazil, a Member of the International Advisory Board for the National University of Singapore. He served on several advisory committees of the U.S. Government and academia. These include Advisory Committees of the U.S. Army (Advanced Strategic Missile Defense), the Air Force (Science Advisory Board), and the Navy (Office of Naval Research), the Los Alamos National Labs, Lockheed Research, IBM, the University Systems of Florida, Texas, Missouri, California, Toronto, etc. He has published more than 200 papers and co-edited three books.