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50 Years of IFIP

Developments and Visions



The International Federation
for Information Processing

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IFIP 50th Birthday

A “round birthday” of a federation is a good reason to celebrate; but even more it is an opportunity to consider the past and the future, to study the circumstances under which the federation was created/started and in which way the different aspects and situations have changed so that new perspectives are to be considered, new efforts and “tools” are to be created. In order to immediately switch from generalities to our subject, so close to our hearts, I choose the biggest change in those 50 years, a change which we have created ourselves: the change from the isolated computer to the computer network, the creation of World Wide Webs. The computer user is no longer forced to concentrate his attention to his machine – he is invited to use his processing machine for communication, to make use of any application from partners all over the world and of the stored information available in all the storage units connected over all continents.

This situation asks us, for instance, whether the IFIP Congress shall be continued in its traditional form. By the way: to my regret organizers have often renamed the IFIP Congress as “World Computer Congress” as if IFIP was no longer the main supporter of the event. No, we have not given up the responsibility for it, we vote for the place and the organizer. But is the get-together in our days in the same nature as ICIP 1959 or IFIP Congress 1962?

Fifty years ago the congress could cover the subject “computer” and could attract almost all of the great magicians of the new field. You could, as a participant, talk to each of them in the corridors, you heard their contributions and you soon had those contributions in your hands: the proceedings were the best documentation of the international, global progress of information processing, of its history.

Today you can call up all of the authors on the screen of you computer, not just the one paper they would read before the congress. You have their life work at your disposal and your problem now is the quantity of authors and papers, to find what you are looking for or to discover the new line of development which might help you.

I just called the cream of our field “magicians.” This is justified. Which other field can present a progress of the essential parameters with a factor of a thousand every 20 years? We have done that – admittedly with the help of our colleagues in the field of electrophysics – three times already and I can see no reason why this should not happen again more than once. If the present chip cannot keep up with this triumph, we will turn from the wire (that got too thin) to light and quantum physics.

My first computer had a poor 15 storage cells. Today you can get four megabytes for 8€ or 8\$. Storage is no problem except to find what you search for. Parallel processing increases the power of our system and if you need more, you let computers run in parallel, maybe half of them on a different continent.

Because we have included teleprocessing in our systems and our limitation there is speed of light.

We are magicians. But even magicians remain human beings, limited and error-prone, not always realizing that they have lost orientation. Their achievements depend also on the quality of their language. And language, in the world of today, is underestimated on all levels, from children to public speakers.

My first transistorized computer in the mid-1950s was built and run by a team of seven people. The team knew everything about our machine. Today, if you want to have all the people together who know everything about your laptop, you had better hire one of the top sport arenas. And the discussions between the groups of specialists suffer from both the isolating differences of the group languages and the diminishing mastering of the general language. Sure, our language is English and many English terms are used in all other languages. But many of our ultimate customers are not specialists and the culture of high-language explanations is as important as 50 years ago. Moreover, our field is guilty of a good part of the flooding of other languages with English words.

Which consequences does this flood of developments have for IFIP and the IFIP Congress? Are we watchful enough to recognize changes and to transfer them into new ideas on how to run IFIP? How do we attract the key scientists of our field? How do we get 5,000 participants as I had in Stockholm 1974?

Indeed, we have many reasons to consider new perspectives, not merely as a side effect but as a main task – realization included.

December 2010

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Preface

The mission of this book is to report where IFIP stand in the 50th year of its existence, and how IFIP developed until 2010. This is the fourth book in a series of status reports which have so far been edited by Heinz Zemanek, IFIP Historian and Honorary Member, published at specific intervals:

- Reporting the status after 10 years, Heinz Zemanek edited the book *The Skyline of Information Processing*, published in 1972 by North Holland
- Reporting the status after 25 years, Heinz Zemanek edited the book *A Quarter Century of IFIP: The IFIP Silver Summary*, covering the proceedings of the 25th Anniversary Celebration of IFIP in Munich, March 1985, published 1986 by North Holland
- Reporting the status after 36 years, Heinz Zemanek edited the book *36 Years of IFIP*, published 1996 by IFIP Secretariat (IFIP Press)

This fourth report stands on the shoulders of its predecessors and summarizes where IFIP stands in the 50th year of its existence, how the IFIP Organizing and Technical Committees developed in the last few years, including some arguments about successes and problems. A special part is dedicated to the 21st IFIP World Computer Congress 2010 which was the major event to commemorate IFIP's 50th anniversary. Future plans and "visions" are described by Leon Strous, who took over the presidency in 2010 and who will lead IFIP in the next few years.

In the age of the Global Information Society, IFIP strongly supports open availability of scientific and technical information. Consequently, this book is available both in printed form (published by IFIP press at IFIP secretariat in Laxenburg, Austria) AND from IFIP's Digital Library (available from the IFIP website).

Finally, the editors wish to thank all those who have contributed to this book, especially present and past IFIP office holders, present and past chairs of IFIP Technical Committees and Working Group chairs. In addition, we wish to express our gratitude to Augusto Casaca, Chair of the International Program Committee, and Nick Tate, Chair of the Organizing Committee of the IFIP World Computer Congress 2010 in Brisbane. And last but not least, the editors wish to thank Eduard Dundler, IFIP Secretary General, for his strong support.

December 2010

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The History of TC 14 on Entertainment Computing

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Abstract. Entertainment computing is on its way getting an established research arena in industry and academia as well. To bring all the different contributing research communities together shared resources (e.g. email distribution list, conference series, and journals), organizational structures (e.g. special interests groups, technical committees, etc.) and unifying ideas are helpful. One unifying idea in this diverse community of entertainment researchers and developers might be a normative position to enhance human living through social transformation by entertainment technology.

Keywords: IFIP, TC14, Entertainment Computing.

1 Introduction

The advancement of information and communication technologies (ICT) has enabled broad use of ICT and facilitated the use of ICT in the private and personal domain. ICT related industries are directing their business targets to home applications. Among these applications, entertainment will differentiate ICT applications in the private and personal market from the office. Comprehensive research and development on ICT applications for entertainment will be of utmost importance for the promotion of ICT use in the home and other places for leisure. So far engineering research and development on entertainment has never been really established on large scale in academic communities. On the other hand entertainment related industries such as video and computer game industries have been growing rapidly in the past, and today the entertainment computing business does outperform the turnover of the movie industry. E.g., entertainment robots are drawing attention of young people; the event called Robo-Cup has been increasing the number of participants year by year. Entertainment technologies cover a broad range of products and services: movie, music, television TV (including upcoming interactive TV), video player, voice on demand VOD (including music on demand), computer game, game console, arcade, gambling machine, internet (e.g. chat room, board and card games, multi-user dungeon MUD), intelligent toy, edutainment, simulation, sport, theme parks, virtual reality, and upcoming service robots.

The field of entertainment computing focuses on users' growing use of entertainment technologies at work, in school and at home, and the impact of this technology on their behaviour. Nearly every working and living place has computers, and the

great majority of children in industrialized countries have computers in their homes as well. All of us would probably agree that children need to become competent users to be prepared for life and work in the future. Especially children's increasing use of entertainment technologies brings with it both the risk of possible harm [1] and the promise of enriched learning, well-being and positive development [2].

The scope of the research and development arena 'entertainment computing' is obviously quite broad: computer, video, console and internet games; digital new media for entertainment; entertainment robots; entertainment technology, applications, application program interfaces, and entertainment system architectures; human factors of entertainment technology; impact of entertainment technology on users and society; integration of interaction and multimedia capabilities in entertainment systems; interactive television and broadcasting; methodologies, paradigms, tools, and software/hardware architectures for supporting entertainment applications; new genres of entertainment technology; simulation/gaming methodologies used in education, training, and research. A remaining question is how to bring these diverse communities together based on shared and hopefully unifying ideas? In [3] [4], [5] and [6] [7] we started to sketch the scene.

2 Entertainment Computing and IFIP

To address and bring up this new area of entertainment technologies it is important to build a good relationship among researchers and between academia and industries. Takahiko Kamae (Japan) initiated setting up a task force group for entertainment computing. The activities of this task force group had as a first and important result that in August 2000 the General Assembly of the International Federation for Information Processing (IFIP) and their Committee for Cooperation with Industries (CCI) approved of setting up a Specialist Group (SG16) on Entertainment Computing.

First of all, the major efforts of SG16 activities were directed toward demonstrating that the subject could be mature enough to attract the broad interest of ICT community. For this purpose a technical event, the first 'International Workshop on Entertainment Computing' (IWEC), was planned and IWEC Steering Committee members were appointed (Bruce Blumberg from MIT Media Lab, USA; Marc Cavazza from University of Teesside, UK; Jaap van den Herik from Universiteit Maastricht, Netherlands; Tak Kamae from Laboratories of Image Science and Technology, Japan; Donald Marinelli from Carnegie Mellon University, USA; Ryohei Nakatsu from ATR, Japan; Matthias Rauterberg from Eindhoven University of Technology, Netherlands; Demetri Terzopoulos from University of Toronto, Canada).

A first important opportunity came when IFIP Technical Committee on "Human-Computer Interaction" (TC13) kindly offered a time slot for an international panel on entertainment computing at the prestigious INTERACT 2001 conference held in Japan (Tokyo, July 2001). The IWEC Steering Committee decided to accept this kind offer to increase the presence of SG16 and IWEC. At the panel many conference participants showed interests in entertainment computing.

2.1 Conference Series

In the year 2002 the first international workshop on entertainment computing (IWEC) was launched. IWEC 2002 was successfully held at Makuhari (Japan) on May 14-17, 2002. This workshop attracted over 100 participants and over 60 papers were published in the proceedings by Kluwer [8]. At IWEC 2002 were many high quality papers and several interesting technical demonstrations. In other words, evidences that entertainment computing is already an important technical area. At IWEC 2002 we had an extended SG16 meeting, and it was agreed unanimously that the formation of a new technical committee (TC) on Entertainment Computing should be proposed formally to IFIP at the General Assembly at Montreal in 2002.

Based on the success of IWEC 2002, SG16 organised the next event by upscale from workshop to conference: the 'International Conference on Entertainment Computing' (ICEC 2003), that was held on May 8-10, 2003 at the Entertainment Technology Centre at Carnegie Mellon University, Pittsburgh (USA). ICEC 2003 was also successful with more than 100 attendees, 20 highly selected papers, several prestigious keynote talks and invited panels. All the papers for ICEC 2003 have been accepted by ACM for inclusion in their ACM online digital library [9]. To complete the first around the world cycle "Japan-USA-Europe", the third International Conference on Entertainment Computing (ICEC 2004) was held in Europe at the Eindhoven University of Technology in September 1-3, 2004 [10]. This conference attracted 114 submissions of which 62 full papers. Around 150 attendees from academia and industry participated in this successful conference. Full papers, short papers, posters, system demonstrations, and exhibitions from industry were presented in several parallel sessions. The program included three well received keynote talks, three specially invited topic talks, and an outstanding super-chess contest organized by Jaap van den Herik (The Netherlands). ICEC 2005 was successfully organized at the Kwasei Gakuin University in Sanda (Japan) [11], ICEC 2006 at Microsoft Research and University of Cambridge in Cambridge (UK) [12], ICEC 2007 at Shanghai Jiao Tong University in Shanghai (China) [13], ICEC 2008 again at Carnegie Mellon University, Pittsburgh (USA) [14], and most recently ICEC 2009 at Conservatoire National des Arts et Métiers in Paris (France) [15].

Over the last years several conferences on similar topics are initiated by affiliated communities: ACM Singapore Chapter started the conference series "Advances in Computer Entertainment technology" (ACE), and the conference series on Digital Interactive Media in Entertainment and Arts (DIMEA); the Center for REsearch And Telecommunication Experimentation for NETworked communities started the international conference series on "Intelligent Technologies for Interactive Entertainment" (INTETAIN); other related conference series are Conference on E-learning and Games (EDUTAINMENT), European Interactive TV Conference (EuroITV), Conference on designing user experiences for TV, iTV and Internet TV (UXTV), and Fun and Games (FNG). Every year new events are coming up of which some getting established.

2.2 Email Distribution List

Having established successfully the conference series ICEC, we started an email distribution list to keep the community informed. The list has grown to about 2500 list

members, tendency still growing [16]. The worldwide distribution of list members is about 20% America, 25% Asia, 35% Europe, and 20% industry and other organizations from all over the world. The community is actively using this list to post the latest news and announcements in the field of entertainment computing. In 2009 on average 15 postings are done per month [17]. This initiative is next to the IFIP ICEC Conference series another successful service to build up this new community. To support this aim in addition, a new technical committee started in the International Federation for Information Processing (IFIP).

2.3 Technical Committee and Working Groups

In 2002 IFIP approved establishing a specialist group on entertainment computing (SG16). Showing success and sufficient potential for growth, IFIP approved in August 2006 the upgrade from specialist group to a full-fledge technical committee [18, 19]. It was a major achievement to get the official recognition and support of IFIP for this upcoming area of Entertainment Computing. TC14 has by now 24 national representatives of IFIP member countries around the globe, and is organized in seven different working groups active which are shortly described below.



Fig. 1. The birthday picture of TC14 (from left to right: Prof. Mikio AOYAMA, IPSJ representative; Dr. Benjamin SALEM, TC14 Secretary; Prof. Ryohei NAKATSU, TC14 chair; Prof. Tadao SAITO, IFIP GA Member Japan; Prof. Klaus BRUNNSTEIN, former IFIP President)

Digital Storytelling: Storytelling is one of the core technologies of entertainment [20]. Especially with the advancement of ICT, new type of entertainment called video games has been developed where interactive story development is the key that makes those games really entertaining. At the same time, it has not been studied well what is

the difference between the interactive storytelling and the conventional storytelling. Also as the development of interactive storytelling need a lot of time and human power, it is crucial to develop technologies for automatic or semiautomatic story development. The objective of this working group is to study and discuss these issues.

Entertainment Robot: Robot is becoming one of the most appealing entertainment technologies [21, 22]. New entertainment robot and/or pet robot are becoming popular [23]. Also, from a theoretical point of view, compared with computer graphics based characters and animations, robots are an interesting research object as they have a physical entity [24-26]. Taking these into considerations, at the SG16 annual meeting in 2004 it was decided that a new working group on entertainment robot has to be established.

Theoretical Basis of Entertainment: Although there are huge entertainment industries already such as video games, toys, robots, etc., little academic interest has been paid on such questions as what is the core of entertainment, what is the technologies that would create new entertainment [27], and how the core technologies of entertainment can be applied to other areas such as education, learning and so on. The main objective of this working group is to study these issues [4, 28-30].

Games and Entertainment Computing: This working group focus on the research and development of computing techniques for the improvement of computer games and other forms of computer entertainment [31, 32]. The scope of this working group includes, but is not limited to the following applications, technologies and activities. Applications are: Analytical games (e.g., chess, Go, poker [33]); Consumer games (e.g., action games, role-playing games, strategy games; mobile games (e.g., mobile phones, PDA's) [34]; interactive multimedia (e.g., virtual reality, simulations); and technologies: Search techniques, machine learning, reasoning, agent technology [35], and Human-Computer Interaction [36, 37].

Social and Ethical Issues in Entertainment Computing: The aims of this working group are to foster the ethical design, development, implementation, applications and use of entertainment computing [38, 39]; to encourage surveys and studies on social, ethical and cultural aspects of entertainment computing [1, 2, 40, 41]; to develop methodologies for studying social, ethical and cultural implications of entertainment technology; and to establish a global platform for interaction, exchange, joint initiatives and co-operation between such groups as: The end users of entertainment computing, industrial developers and designers of entertainment computing, policy, decision making, social and consultative bodies, academics and scientists. This working group explicitly cares about the position of and the potentials for, vulnerable groups such as children, the less-educated, disabled, elderly and non-employed people, cultural minorities, unaware users and others [42].

Interactive TeleVision (ITV): The aims of this working group are promoting visibility and increasing the impact of research and development in the ITV field [43, 44]; to bring together interdisciplinary approaches to ITV research and development issues (e.g. content production, computer science, media studies); to encourage cooperation

between researchers and other established bodies and organizations, through the development of joint project proposals; and to facilitate the development of suitable academic and practical teaching programs. Research fields cover alternative content distribution (mobile TV, peer-to-peer TV, IPTV); interactive storytelling, user contributed content; interactive and personalized advertising systems; applications for t-commerce, t-learning, t-health, entertainment; ethical, regulatory and policy issues; interoperability of middleware, standards, multimedia metadata; authoring, production and virtual reality systems; content management, digital rights management; multimedia, graphics, broadcast and video technology; content enriched communication services, video conferencing; personalization, user modeling, intelligent user interfaces; and usability, accessibility, universal access, multimodal interaction.

Art and Entertainment: The influence of technology and scientific innovation is profoundly changing how we express ourselves [45]. Arts and Entertainment is a new field that represents the exciting convergence of technology with the established design discipline [46, 47]. The Media Arts and Cinema offers a comprehensive approach to design that encourages innovation by media artists, scientists and engineers [48]. This working group will pursue the following activities: To explore the way art and cinema aesthetics can play a role in different areas of computer science ; one of its goals is to modify computer science by the application of the wide range of definitions and categories normally associated by making art and cinema [49]; to go beyond the usual definition of art and cinema aesthetics in computing, which most often refers to the formal, abstract qualities of such structures in the context of computer science: a beautiful proof, or an elegant diagram; to research the broader spectrum of aesthetics [50], from abstract qualities of symmetry and form to ideas of creative expression and pleasure [51]; and to prove the assumption behind art and cinema aesthetic computing that the field of computing will be enriched if it embraces all of aesthetics [52].

2.4 A Peer Reviewed Scientific Journal

One of the most important initiatives for supporting entertainment computing was launching this scientific journal on 'Entertainment Computing' with Elsevier. This journal has us (Ryohei Nakatsu and Matthias Rauterberg) as founding editors in chief. In addition we have an editorial board of 28 distinguished colleagues from all over the world acting as associate editors, and in addition a growing list of high level experts for the most important task of thorough and rigorous peer reviewing. For the editorial board we have balanced regions (America, Asia, and Europe), as well as academia and industry. Fortunately we could also get the support from IFIP to run this journal as an 'official journal of IFIP'. With the keen interests and kind support from the community we will do our utmost to establish this journal as the premium publication and communication channel for our field of entertainment computing. This might help to achieve a high quality of life by social transformations through entertainment technology.

Entertainment Computing publishes original, peer-reviewed research articles and serves as a forum for stimulating and disseminating innovative research ideas, emerging technologies, empirical investigations, state-of-the-art methods and tools in all

aspects of digital entertainment, new media, entertainment computing, gaming, robotics, toys and applications among researchers, engineers, social scientists, artists and practitioners. Theoretical, technical, empirical, survey articles and case studies are all appropriate to the journal. Specific areas of interest include: Computer, video, console and internet games; Digital new media for entertainment; Entertainment robots; Entertainment technology, applications, application program interfaces and entertainment system architectures; Human factors of entertainment technology; Impact of entertainment technology on users and society; Integration of interaction and multimedia capabilities in entertainment systems; Interactive television and broadcasting; Methodologies, paradigms, tools, and software/hardware architectures for supporting entertainment applications; New genres of entertainment technology; Simulation/gaming methodologies used in education, training, and research. In the area of empirical and experimental studies contributions are invited which are very well documented, innovative, and tested or evaluated in a particular entertainment domain.

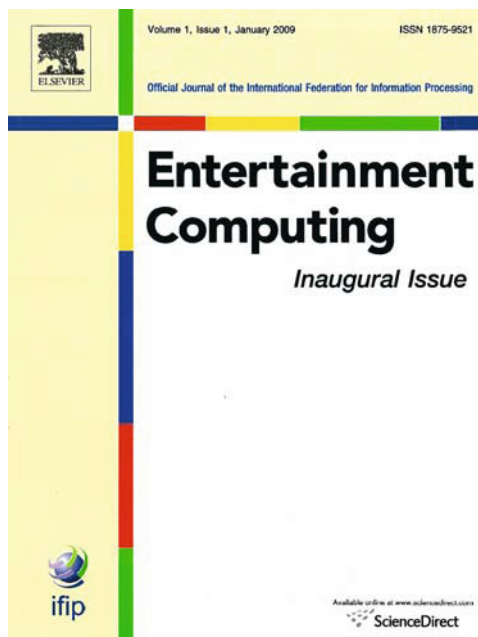


Fig. 2. Layout of the new IFIP journal on Entertainment Computing published by Elsevier

2.5 TC14 Pioneer

Takahiko Kamae (PhD Electrical Engineering 1966; male) was director of research and development, Laboratories of Image Science and Technology (LIST), Tokyo, Japan, responsible for such projects as networked appliance architecture and IT-supported healthcare management. His past R&D work includes a facsimile communication system, digital videotex, and sketchphone. He received the Medal with Purple Ribbon from the Japanese Government in 2000 for his achievements of

facsimile communication system. He organized the first International Workshop on Networked Appliances (IWNA) in November 1998 in Kyoto and served as its general chair. He was chair of the Multimedia Communications Technical Committee, IEEE ComSoc (1999-2001), and was chair of the IFIP Entertainment Computing Task Force. He received his B.S. and M.S. in electronics from Kyoto University and his Ph.D. in electrical engineering from the University of Illinois at Champaign-Urbana. He worked for NTT for 26 years, and was vice president and executive manager of its Human Interface Laboratories from 1990 to 1993. After NTT he joined Hewlett-Packard and was director of its Japan Laboratories from 1993 to 1999. He was member of the advisory board of the Faculty of Advanced Techno-Surgery -Institute of Advanced Biomedical Engineering & Science at Tokyo Women's Medical University.

He retired from NTT, a Japanese telecommunication carrier and started a new career with Hewlett-Packard in 1993. After he took a PhD in 1966, his career began as a research engineer with NTT in 1967. The biggest project he was involved in was the development of a facsimile communication network, which is now nicknamed F-net. From 1990 to 1993 he led NTT's Human Interface (HI) Laboratories as the executive manager. R&D work at NTT's HI Labs includes video compression/ decompression, video and image processing, speech recognition/ synthesis, multimedia human interfaces, and human factors. Based on the discussions held at the labs, he organized the International Workshop on Networked Reality in May, 1994, in Tokyo. The workshop was very successful with good participants from many countries and very stimulating discussions. Multimedia, virtual reality and the information superhighway were really attracting attention in many countries.



Fig. 3. The TC14 pioneer Takahiko Kamae among his peers at ICEC 2005 in Sanda, Japan (from left to right: Dr. Benjamin SALEM, secretary; Prof. Dr. Zhigeng PAN, representative from CHINA; Prof. Dr. Takahiko KAMAE, IFIP Pioneer; Prof. Dr. Sidney FELLS, representative from CANADA; Prof. Dr. Matthias RAUTERBERG, representative from The Netherlands)

In April, 1994, he joined Hewlett-Packard (HP) and began a computer science research laboratory for HP in Tokyo. His organization was called Hewlett-Packard Laboratories Japan (HPLJ) and is located in Kawasaki City, a southwest neighbor of Tokyo. His experiences at Champaign-Urbana helped him a lot to adapt to a U.S.-based company culture. He met people from different countries as well as many Americans on the campus. Such globalism in U.S. universities made his student life at Urbana enjoyable and also stimulating. HP is also cherishing such globalism. It is one of the reasons he liked HP.

For his lifetime achievements and his visionary role in setting up and chairing the taskforce group for 'Entertainment Computing' he is recognized and honored as IFIP TC14 pioneer.

3 Future Directions

Over the last decades the rapid innovation in ICT has offered ever faster and more versatile access to ever more data, knowledge and information. Although this is of much practical value, the transformative social power of the technology is based on its opening and closing of opportunities for us to have control over shaping and re-shaping our electronic and physical access and the terms of access to the knowledge and other resources we need to enable us to earn a living, learn, engage in political debate and action, meet people, choose our sources of news, information, and entertainment, and many other activities essential to determining our quality of life.

Between now and the near future, digital technologies will become even more powerful and affordable for all users and at every level, in digital networks and in product offerings. An increasing number of people will be able to compile, program, edit, create and share content; as a result, they will gain more control and become more immersed in media experiences. But more than technical challenges, the social implications on human behaviour will be of most importance. We need a media ecology movement to heighten consciousness to fight the waste and pollution that media can produce. It is indeed a challenge for the mental environment of our children and future generations. The questions we must ask ourselves are: Do we give them a world that is challenging, stimulating, inspiring, and really entertaining? Do we encourage their intelligence, creativity and curiosity?

Acknowledgements. We are very grateful to the International Federation for Information Processing (IFIP) to accept our proposal for setting up the Technical Committee on Entertainment Computing (TC14). We are also very grateful to all countries having their national representative nominated for this TC14.

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