50th Anniversary International Medical Informatics Association (IMIA) History Working Group and Its Projects

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Abstract

The IMIA History Working Group has as its first goal the editing of a volume of contributions from pioneers and leaders in the field of biomedical and health informatics (BMHI) to commemorate the 50th anniversary of IMIA's predecesor IFIP-TC4. This paper describes how the IMIA History WG evolved from an earlier Taskforce, and has focused on producing the edited book of original contributions. We describe its proposed outline of objectives for the personal stories, and national and regional society naratives, together with some comments on the evolution of Medinfo meeting contributions over the years, to provide a reference source for the early motivations of the scientific, clinical, educational, and professional changes that have influenced the historical course of our field.

Keywords:

Medical Informatics; Nursing Informatics; Organizations

Introduction

The 16th World Congress of Medical Informatics - Medinfo 2017 in China, will mark the 50th Anniversary since the International Federation of Information Processing (IFIP) Societies approved the formation of the Technical Committee (TC) 4 on Medical Information Processing, which was the predecessor of IMIA. The IMIA History Working Group (WG), since 2014, has been working on organizing and writing about the international history of biomedical and health informatics (BMHI), and is editing a book of contributed articles from leaders in the field to commemorate the occasion. This article provides an overview of the work leading up to the book, and describes a preview of the goals, structure and evolution of what it is intended to cover.

Methods

The IMIA History eBook to be published by IOS Press, will contain original autobiographical retrospectives by pioneers and leaders in the field, together with professional organizational histories of the national and regional societies and working groups of IMIA, as well as interpretive commentary on a number of important themes and topics, which have evolved changes as scientific and clinical practices under the influence of new insights, technologies, and the changing socio-economic, cultural and professional circumstances around the globe over the past 50 years.

IMIA History Taskforce

Discussions during IMIA Board meetings during the first decade of the millennium brought up the subject of recording more systematically the history of the organization, and how the structure and functions evolved with changing research and practice trends in the field. A Taskforce on the History of Biomedical and Health Informatics was proposed and approved in 2009, and was composed of representatives from all the major regional associations: Casimir Kulikowski (USA/AMIA-North America, Chair), George Mihalas (Romania/EFMI-Europe), Hyeoun-Ae Park (Korea/APAMI – Asia-Pacific), Sedick Issacs (South Africa/HELINA – Africa), Alvaro Margolis (Uruguay – Latin America). The long-time secretary of IMIA, Diarmuid UaConnaill, was able to provide many original documents of the Association, including minutes from past Board and General Assembly meetings. A Wiki media repository was set up at Rutgers University (http://infohistory.rutgers.com) by Charles McGrew to make these documents openly accessible, and to index them and summarize the time-lines of IMIA developments graphically, together with thumbnail sketches of past leaders of IMIA. These materials are aimed at chronicling the development and evolution of IMIA, its contributors, its sponsored events, its publications, and its history. The role of the Taskforce was to coordinate and channel the interests of IMIA members related to the history of the organization, to lead the recording of personal and group recollections, and to write about how the field has developed from a wide range of international perspectives. The members of the Taskforce solicited articles for the IMIA Yearbook about the History of the field, and also contributed their own perspectives [1,2,3,4,5,6,7].

Over the past years, the IMIA History Taskforce organized workshops and panels at many conferences, including: Medinfo 2010 in Cape Town, the IMIA-LAC 2011 meeting in Guadalajara [8], many AMIA Annual Meetings and ACMI Meetings since that date, the Oslo MIE 2011, APAMI in Beijing in 2012, the Prague Workshop held in conjunction with the EFMI-STC in April 2013, the Medinfo 2013 Congress held in Copenhagen [9], MIE 2014 in Istanbul [10], and APAMI 2014 in New Delhi. A related historical anniversary took place in 2011 in Heidelberg – the 50th year of publication of the first and official IMIA journal of medical informatics: *Methods of Information in Medicine (MIM)*. The IMIA President, Reinhold Haux organized a symposium, which discussed many changes that have taken place in medical and health informatics since the founding of *MIM* by Gustav Wagner in 1962. The Copenhagen Medinfo 2013 saw important discus-

sions on the systematic elicitation of articles on the history of the field, while at the Prague EFMI-STC, earlier that same year, there had been a special workshop on European History, which led to publications in the proceedings [10, 11, 12, 13] and later a set of books edited by two of the participants, Izet Masic and George Mihalas [14], who compiled papers and biographical materials. In order to recognize the activities of the IMIA History Taskforce, its members proposed to transform themselves into a Working Group, and this was approved by the IMIA General Assembly in August 2014 at the APAMI New Delhi meeting.

IMIA History Working Group

Shortly after the IMIA History WG was established, there was an important anniversary in the USA – the 30th anniversary of the American College of Medical Informatics (ACMI). Kulikowski, who also chairs the ACMI Committee of Historians, worked with Alexa McCray to organize two commemorative panels [15] at AMIA 2014: the first with pioneers who were instrumental in the formation of ACMI, and the second with leaders of the field to cover the three decades intervening. After this, the IMIA WG prepared a workshop for Medinfo 2015 in Sao Paulo, where the plans for the 50th Anniversary book were discussed, and prospective contributors identified and invited. At the same time, plans were made to participate in the EFMI-STC to be held in Paris the following April of 2016. This was important because included a presentation on the founder of IFIP-TC4, Dr. Francois Gremy, by his daughter Isabelle, and another on Dr. Peter Reichertz, who was a most influential pioneering researcher and teacher in medical informatics from Hannover in Germany, by Rolf Engelbrecht. In the remainder of 2016, three conferences were instrumental in obtaining further commitments from contributors to the proposed History Book from around the world – Nursing Informatics 2016 in Geneva, HEC-MIE 2016 in Munich, and the AMIA 2016 meeting in Chicago. At EFMI, the IMIA General Assembly voted to fund the publication costs of the IMIA History, thus making it possible to proceed with formal invitations and plans for publication with IOS Press. At the AMIA 2016 meeting, there was yet another anniversary to celebrate –the Symposium of Computers in Medical Care (SCAMC), which was the main vehicle for disseminating research in medical informatics in the USA before the creation of AMIA. The meeting brought together leaders in writing the history of nursing, public health, and other clinical informatics to help coordinate their contributions to the IMIA History.

Some Historical Highlights of IMIA-Related Biomedical and Health Informatics in Asia

The history of biomedical and health informatics in Asia goes back to the establishment of several national societies, and the decision by IMIA to hold the Third World Congress on Medical Informatics - MEDINFO-80 [17] under the leadership of Dr. Shigekoto Kaihara, a pioneer in medical hospital systems and computer-based decision-making at Tokyo University, who also established the Japan Association for Medical Informatics (JAMI). Many international and Asian participants came to this first Asian MEDINFO, including delegates from China, establishing collaborations which have been ongoing to the present day. The China Medical Informatics Association (CMIA) was founded in 1981 [18], helped organize MEDINFO 89, as did Singapore, which sponsored the China-Japan Medical Informatics Symposium in 1991, twelve China Medical Informatics Conferences since 1999, and a series of Pacific Health Informatizaton Summits since 2006 – and it is now   hosting MEDINFO 2017 in Xiamen.

KOSMI, the Korean Society for Medical Informatics hosted MEDINFO 98 in Seoul, providing a major impetus for the development of biomedical and health informatics in the Asia-Pacific, which had by then formed its own regional association – APAMI, which held its inaugural conference in Singapore in 1994. Nursing Informatics (NI), which has its own Special Interest Group within IMIA, has flourished in the Asia-Pacific region, where KOSMI-NI hosted the 9th International Congress on Nursing Informatics in Seoul, from which the leadership developed a plan for the future of the field [19]. This is just one notable example of how coordination between IMIA, APAMI, the specialty groups, and national societies ensures the continuing vibrant growth of our interdisciplinary field of biomedical and health informatics throughout Asia, with strong international ties worldwide.

Results

IMIA 50th Anniversary Book Outline

The result of all the meetings organized or sponsored, in whole or part by the IMIA History WG over the past years, has been the gradual development plans for the publication of the IMIA History in 2017. As of this writing (April 2017), a large number of individual contributions have been already received, and a final set of invitations sent out to cover more comprehensively not only individual members, but also the histories of member societies and groups affiliated with IMIA: regional and national societies, special interest groups, and working groups. A schematic outline of the 50th Anniversary book is as follows:

PART 1: Collection of Short Personal Narrative or Individual Stories (about 2 to 5 pages in length). Each story is intended to address questions of how individual researchers and practitioners got started in biomedical and health informatics, and how their own work and engagement in the discipline unfold from their individual perspective: who inspired them in their work? what were the main ideas? What were challenges and informatics projects that got them started in the field? together with a brief reference to their main changes in direction since then. Summarized current reflections on the outcomes of early work from today's perspective were encouraged. With the above in mind, and at the request of many contributing authors, templates were developed to suggest questions that the personal stories could address, such as:

- Who inspired you to work in BMHI, or what circumstances determined your choice and how did this happen?
- What motivated you to get started and what were the main ideas or examples of biomedical science, information, and technology that inspired you?
- What were your initial expectations from your first project and what were the challenges you faced in realizing them?
- How did your first experiences in BMHI influence what you did next, and have done since? Summarize briefly your major changes in research, practice, or educational approaches, and their impact on your informatics contributions.
- What have been other experiences and professional position opportunities affecting your life work in BMHI?
- What are the social connections and relationships that were essential to your work, and how have these changed over time and with new technologies?
- How have the international dimensions of your work promoted or contributed to collaborations in research,

practice, education, or professional activities in organization and publications, conferences or other meetings, either locally or nationally? and did they have broader impact at regional and international levels for significant advances in BMHI?

- Other significant individual critical insights on BMHI developments beyond the above.
- From the perspective of 2016, what do you see as key shifts in "grand challenges" that you have dealt with in our discipline, and how have these inspired or challenged your work, and helped your personal and professional development?

Only a few citations to past publications have been requested, focusing on the most essential original and/or most recent summaries or reviews, so as to provide guideposts to any interested reader to pursue further searches online.

PART 2: Summaries of national and regional BMHI organizational short history entries, authored by country or region, from an informatics-related society or publication that authors have participated in – preferably in a leadership position, or with close participation and knowledge of the society.

A suggested template for Part 2 essays a requested by prospective authors suggest addressing the following:

- Briefly list major precursor work in underlying or related disciplines that influenced the emergence of BMH informatics, and briefly list major people influencing this.
- Which were the first contributors to the field in your country, with their institutions and fields of BMHI activity and major project titles (where known)?
- What were the major topics addressed by early informatics work in your country?
- When and how was informatics organized professionally in your country or region – relation to IMIA (and other national or international societies and institutions when relevant)?
- How did informatics evolved over its first 2-3 decades in your country/region – concentrating on the early days of the field, but bringing the short summary history to the present when possible.
- Short chronological listing of major early professional leaders in your country/region with roles, related to institutional affiliation and major projects.
- Brief listing of major conferences sponsored by professional BMH informatics societies in your country.
- Compare and contrast very briefly (a long paragraph at most) highlights of early vs. current work in BMHI in your country.

PART 3: Brief IMIA Working Group history entries, and short interpretive entries about publications and major research projects or programs of BMHI. The suggestions for this part of the book are included as a much shortened version of the above for professional societies.

Trends in MedInfo Contributions

A paper in the IMIA Yearbook of Medical Informatics, by one of the present authors [20], summarized the changes in full-paper contributions to MedInfo by broad subject areas and by first author geographic region up to 2004. We have reviewed the trends and how they have changed, by looking at similar statistical breakdowns for the 2007 and 2015 MedInfo, to see if there have been notable differences over the past decade.

The major subject areas were: 1) Health and Clinical Management, 2) Patient Records, 3) Health Information Systems, 4) Sensor, Signal & Imaging Informatics, 5) Decision Support, Knowledge Representation and Management, 6) Educational and Consumer Informatics, and 7) Bioinformatics.

The total of full papers presented at Medinfo International Congresses seen to have grown steadily in the past decade compared to previous decades – for the Medinfo 2015 there were 512, for the 2007 there were 459, in contrast to 302 for the Medinfo 2004, and around mid or upper 200's or low 300's for the previous two decades.

The percentage of total for each of the categories is as follows:

1. Health &Clinical Management: 13.1% (2007) vs. 12.1% (2015)
2. Patient Records 18.3% vs. 14.8%
3. Health Information Systems: 13% vs. 23.2%
4. Sensors, Signals and Imaging Informatics: 4% vs. 3%
5. Knowledge Representation & Management, NLP, Decision Support: 17.6% vs. 19.3%
6. Education and Consumer Informatics: 21.6% vs. 19.1%
7. Bioinformatics: 1% vs. 1%.

We can see from the above list, that the only major changes over the 8 years were between Brisbane and Sao Paulo was that Patient Records (PR), which decreased somewhat, and Health Information Systems (HIS) increased by about the same amount. The latter is largely because the Data Bases category was included in HIS rather than PR, since the DB is more a systems function and can cover all kinds of databases, not just patient records. The jump in NLP is what accounts for the most of the rise in category 5 in 2015. Most of the other areas remain about at the same level.

The breakdown by the six broad subject areas indicated above, as computed by percentage of total papers, indicates certain trends that correlate with recent technological advances in mobile computing, interoperability, and databases, as well as the persistence of emphasis on computer decision support and knowledge representation (ontologies) and management, with a recent (MedInfo 2015) growth in the area of artificial intelligence, which specifically correlates with international trends in applications of machine learning for big data in all kinds of areas, including specifically clinical data. Notable also is the increase of papers contributed in the subarea of natural language processing (NLP), which reflects recent advances in this field.

In health informatics, there continue to be steady contributions in the areas of information systems for clinics and hospitals, and the field of nursing informatics has increased its participation in Medinfos very noticeably in the past couple of decades. The number of papers submitted on electronic patient records grew dramatically in 2007, by over 30% above the 2004 contributions, reflecting initiatives in this direction worldwide, and the especially strong impetus in the USA during this period; hoever, in 2015, had gone down again.

In education and consumer informatics, there has been a noticable increase, including, not surprisingly, the new subarea of social media.

On the other hand, Medinfos have seen a continuing, but persistently low participation by authors submitting in the more scientific and technical subjects of sensor, signal and imaging informatics, and also bioinformatics, which reflects the difficulties of attracting these communities to contribute to general biomedical and health informatics, when most of their advanced discussion and research impact comes from presenting and publishing in their own specialty conferences.

The geographical distribution of contributions to Medinfo meetings over the years provides ample support for the early decision of IMIA to rotate the locations around the world, so

that all regions would have a chance to enjoy the hosting in succession, and encourage international participation most amply in the spirit of the Association. An overview of contribution breakdown, by percentage of papers in recent Medinfos, confirms the patterns of contributions that were noted earlier [20]. Looking at the 2007 Brisbane meeting, we see that the Asia-Pacific (AP) region was represented by 23% of contributors of full papers (upon which this comparison is made). This is approximately double the percentages of AP author contributions for Capetown 2010 (13%) and Sao Paulo 2015 (12%). European contributions, which have usually been the most substantial in number to all Medinfos outside those held in North America (NA), when NA attendance has predominated, showed the same for Brisbane (42% vs. 31% for NA) and Cape Town (at 51% vs. 24% for NA contributors), but not for Sao Paulo (29%), when North American authors contributed the most (33%). For the Sao Paulo Medinfo in 2015, Latin American contributions rose to 24%, in contrast to the regional contributions to the Congresses at other locations earlier, where their contributions have usually been between 1% and 6% (in Cape Town), demonstrating not only the rise in medical and health informatics in Latin America, but also the critical importance of rotating the locations. In a somewhat, but even more extreme parallel, the African first-author full paper participation at Cape Town, although still low at 7%, was seven times greater than participation at other Medinfo venues, when it never exceeded 1%, thus reflecting both the very restricted impact of health informatics in the continent, as well as the overwhelming organizational and financial difficulties of travelling for potential participants and practitioners from most of the continent. The Asia-Pacific participation, though reflecting a very different dynamic due to the advanced development of biomedical and helath informatics in many of the countries, does, in all likelihood, reflect the factor of cost and convenience of travel to far-off venues, since participation in the Tokyo 1980 meeting was 35%, in Seoul 1998 was 25%, and Brisbane 2007 was 23%, all are predominantly higher than Asian-Pacific contributions to Medinfo meetings held elsewhere, such as Amsterdam 1983 (13%), Washington 1986 (7%), London 2001 (16%), San Francisco 2004 (7%), Cape Town 2010 (13%), and Sao Paulo 2015 (12%). We can therefore reasonably expect that the upcoming Medinfo 2017 in China will confirm this pattern and the importance of the regional rotations, as a wise policy of Medinfo organization for developing a world community of shared research, practice, and education, by encouraging the participation and dissemination of the most recent results in the field of biomedical and health informatics, dating back to its earliest days.

Discussion

For the IMIA History book progress, we can report that, from the contributions received so far, some authors have followed the template suggestions, and providing systematic accounts of the development of their professional lives and contributions to the field. Others have written very reflective and insightful (and sometimes even poetic) stories about the most important inspirations and aspects of their lives, and how they have affected their work in biomedical and health informatics. The present paper provides some preliminary perspective on the activities of the IMIA History WG, from which one can extrapolate for the future, when we expect to continue requesting contributions for further sets of papers on the history of our field for the IMIA Yearbook and other journal publications, for the History MediaWiki, and for potential further collected volumes on more specific topics of

research, practice, and education as experienced by those in our field.

Conclusion

The enthusiasm and progress in obtaining contributions from pioneers and leaders in biomedical and health informatics is a good sign that the 50th Anniversary IMIA History will become a unique original reference publication for future historians to study and derive their own conclusions about the very diverse motives, inspirations, and professional journeys of practitioners, technologists, and educational specialists in our field. The essays received so far have excellent original content, and eloquent writing, which reveals patterns of thought and argument that should be of great interest to present practitioners, as well as for future investigators and historians in our field. We look forward to completing this project as a first step in ongoing documentation, archiving, and historical writing about the development of international biomedical and health informatics. It will highlight how IMIA and its constituent societies have played a central role in spanning the global diversity of the field, encouraging scientific and professional collaborations, and providing a framework for international coordination and the development of the friendships that are so essential to this, as we approach the 50th Anniversary of the founding of its predecesor organization IFIP-TC4, to be celebrated in China, on the occasion of Medinfo 2017.

Acknowledgements

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