Promoting and Showcasing Health Informatics in Latin America and the Caribbean through Interdisciplinary Collaboration

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ABSTRACT

The first Symposium of Health Informatics in Latin America and the Caribbean (SHILAC 2013) took place in Cancun, Mexico on August 14, 2013 as a part of the eleventh LACCEI Latin America and Caribbean Conference for Engineering and Technology (LACCEI 2013). The theme of the event was "Crossing bridges and borders to identify healthcare issues in Latin America and the Caribbean (LAC) and to brainstorm on how health informatics might address these issues in a dynamic environment which values the participation of all of the attendees." The three primary objectives of the event were 1) to showcase health informatics in Latin America and the Caribbean 2) to identify the top health issues in LAC that can best be addressed with health informatics and 3) and to brainstorm and prioritize possible health informatics solutions to those issues. A summary of the key events, an evaluation of the event, as well as an overview of future work are discussed in this paper.

Keywords: health informatics, Latin America, Caribbean, hackathon, SHILAC 2013, big think

1. INTRODUCTION

Despite the progress of technology in banking, commerce, aviation, and entertainment industries, the medical profession has been slow to adopt novel technology and opt for evidence-based medicine. (Kellerman & Jones 2013) It is often heard that health informatics has the potential to transform the way medicine is practiced and to greatly improve the health of patients around the globe. (Hersh et al. 2010) However, it is still far too common to hear of cases where the task of entering data into an electronic health record is performed manually instead of being automated thereby introducing human error (O'Malley 2011) or of cases where systems are not interoperable or easy to use (Keller & Jones 2013) to name a few. The Symposium of Health Informatics in Latin America and the Caribbean (SHILAC 2013) was created with the purpose of bringing communities together across borders to brain storm on how situations similar these and others could be improved in a multidisciplinary, cooperative environment.

2. ABOUT SHILAC 2013

A total of fifteen participants attended the symposium from seven different countries – Colombia, Ecuador, Jamaica, Mexico, Peru, Puerto Rico, and USA. Three participants from Chile were not able to attend because of a strike in the airline industry. The symposium had four sponsors listed in order of contribution from left to right – The University of Puerto Rico Río Piedras, The Latin American and Caribbean Consortium of Engineering

Institutions (LACCEI), The International Medical Informatics Association of Latin America and the Caribbean, and The Puerto Rico Clinical and Translational Research Consortium. (See Figure 1)

Figure 1: Sponsors of the SHILAC 2013

3. SELECTION OF THE PROGRAM COMMITTEE

To encourage participation from all countries in LAC, papers and posters were accepted in three languages (English, Spanish, and Portuguese), and presenters were allowed to present in the language of their choice. As a result, all but one member of the program committee was bilingual in at least two of the three languages. However, the primary language of communication was English to encourage the use of English since it is currently the primary language of the top health informatics conferences and publications.

Careful selection of the Program Committee was essential to ensure that the quality of the health informatics publication was on par with that of top-tiered, refereed symposiums in health informatics and to draw submissions from top researchers in health informatics.

The Program Committee:
Dr. Alex Cuadros, Universidad Católica San Pablo, Peru
MSc Erica Guetti, Universidade de São Paulo, Brazil
MSc Álvaro H. Mamani Aliaga, Universidade Federal de São Paulo, Brazil
Manuel Bellido, Google, USA
Dr. César Beltrán Castañón, Pontificia Universidad Catolica del Peru, Peru
Dr. Jesús Cabán, NICoE, Walter Reed National Military Medical Center, USA
Dr. Henrique Andrade, Goldman Sachs, USA
Dr. Gustavo Batista, Universidade de São Paulo, Brazil
Dr. Huei Diana Li
Dr. Jorge A. González Moreno, DuocUC, Chile
Dr. Erika Caballero M, Universidad Central, Chile
Dr. Adrián Pacheco, Asociación Mexicana de Informática Médica (AMIM), Mexico
Dr. Álvaro Margolis, International Medical Informatics Association (IMIA), USA
Dr. Luis Pineda, Universidad Nacional Autónoma de México, Mexico
Dr. Mary Helen Mays, Puerto Rico Clinical and Translational Research Consortium, Puerto Rico

Program Committee Co-Chairs:
Dr. Carol Hullin, DuocUC, International Medical Informatics Association LAC, Chile
Dr. Juan Carlos Puyana, University of Pittsburg Medical Center, US

Local Program Committee Co-Chairs:
Dr. Juan Vargas, Georgia Southern University
Dr. Amado Espinosa, International Medical Informatics Association LAC, Mexico, Co-Chair

Organizing Committee:
Dr. Patricia Ordóñez, University of Puerto Rico Río Piedras, Chair
Dr. Omar Flórez, Utah State University, Co-Chair

Since the aim of the symposium was to encourage publication, authors of rejected papers were offered a mentor and an opportunity to submit an extended abstract for publication in the online non-indexed proceedings of LACCEI, as well as the opportunity to present a poster at the symposium. Accepted papers and posters were indexed in the proceedings of the Conference of the Latin American and the Caribbean Consortium of Engineering Institutions (LACCEI), where the conference was co-located.

4. KEYNOTE SPEAKER
The morning session of SHILAC consisted of highlighting the current state of health informatics in Latin America and the Caribbean. The key note speaker was supposed to be Dr. Carol Hullin, President of the Latin American and Caribbean chapter of the International Medical Informatics Association (IMIA-LAC). Unfortunately, she was not able to attend due to a strike at the airport in Chile. Dr. Michael Brennan, a computer scientist from SecondMuse, an international innovation and collaboration agency, substituted in her place. He spoke of his work at SecondMuse facilitating collaborative, interdisciplinary, and innovative events such as hackathons and scientific and technical challenges. Several people in the audience had never heard of a hackathon and he went on to define it. He also spoke of the importance of defining the health-related problems and issues before addressing possible solutions, thereby setting the stage for the afternoon brainstorming session where the objective was to think of possible health informatics solutions that could address the health-related problems in LAC.

5. SHOWCASING HEALTH INFORMATICS IN LAC
The remainder of the morning consisted of showcasing the current state of health informatics in LAC though presentations by authors of accepted papers. As previously mentioned, papers were accepted in three languages (Spanish, Portuguese, and English). However, papers were only submitted in English and Spanish. Seven papers and one poster were accepted to the conference to maintain the high standards of the program committee. A total of 19 submissions (5 of which were posters) were received from Chile, Colombia, Ecuador, Jamaica, Mexico, Peru, Puerto Rico, and the USA. See Table 1.

Table 1: Papers in Order of Presentation

Twitter Knowledge Inference for Latin American bioSurveillance   Arturo López Pineda (USA), Fernando Suárez Obando (Colombia), Charalampos S. Floudas (USA)
A Proposed RFID Wireless Body Sensor Mesh Network using Intelligent Agents and Cloud-based Architecture   Tyrone Edwards (Jamaica), Tyrone Grandison (USA), Suresh Sankaranarayanan (Jamaica)
Metodología de extracción de parámetros cuantitativos de las Guías Terapéuticas utilizando el CIE10   Irene López Rodríguez (Mexico), Blanca A. Rico Jiménez (Mexico), Blanca Tovar Corona (Mexico),   Laura I. Garay Jiménez(Mexico)
Modelo Computacional para la identificación de endofenotipos y clasificación de pacientes con Artritis Reumatoide a partir de datos genéticos y clinicos utilizando técnicas de Inteligencia Computacional   Luis Morales Muñoz (Colombia), Luis Fernando Niño (Colombia), Gerardo Quintana (Colombia)
Assistive Technology for Paper Form Digitization in Resource-Limited Environments   Huguens Jean (Haiti), Timothy Oates (USA)
A Patient-Driven Model of Electronic Medical Record for Homeless Patients in Puerto Rico   Edgar Ferrer-Moreno (Puerto Rico), Rafael Nieves-Rivera (Puerto Rico)
Using a Policy Spaces Auditor to check for Temporal Inconsistencies in Healthcare Audit Log Files   Tyrone Grandison (USA), Sean Thorpe (Jamaica)
Using mobile applications to support dissemination and implementation of clinical practice guidelines in Colombia (extended abstract for poster acceptance)   Jhon Camacho (Colombia), Fernando Suarez-Obando (Colombia), Carlos Gómez Restrepo (Colombia)

6. THE BIG THINK

The Big Think began after lunch. It focused on identifying the top challenges in health care in Latin America and the Caribbean. A Big Think consists of spending time defining some problems that could be addressed in a particular domain, brainstorming on possible solutions and then prioritizing these solutions as possible candidates to be created at a hackathon. A hackathon, for our purposes, is an interdisciplinary group of people collaborating to develop innovative solutions that use technology to solve problems. Dr. Michael Brennan and Dr. Elizabeth Walker Sabat of SecondMuse led the discussion by asking the audience to define the problems before attempting to solve them. They stressed the importance of focusing solely on the problem, i.e. to define the problem before we frame the problem. The group came up with a list of ten of the most pressing health care issues in LAC as seen in Figure 2. The top challenges included paper records, violence and trauma, chronic diseases, access to healthcare (including limited access due to financial barriers), access to health care information, quality of medical training due to lack of technology, the use of alternative medicine over western medicine, government barriers such as red tape and political influence, and finally the lack of value of technology in medicine.
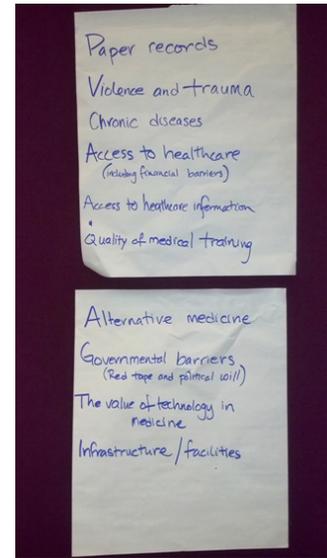
Figure 2: 10 Most Pressing Healthcare Issues in LAC

6.1 FRAMING THE PROBLEM

Following the brainstorming session where we listed the top healthcare challenges in LAC, Michael talked about the importance of "framing the problem." In other words, before even thinking of a solution, it was important to understand the problem by asking six questions for each problem. He suggested that we address these questions in small groups and then come together at the end of the session and share with the entire group. Prior to breaking into the small groups, Michael walked the participants through an example of framing the problem and developing possible solutions using the topic of violence and trauma.

The questions considered included:
1. What information do we wish we had?
2. What information do we have that we wish others had access to?
3. What information would help people make more informed decisions?
4. Where are the market inefficiencies and how could we visualize the data to make it more actionable?
5. How could we make communication more efficient?
6. Finally, what kind of "crowd-sourced" data could be valuable to us and to others?

After considering these questions, the group proposed three possible solutions on the topic of violence and trauma:
- Develop a platform where victims can share their stories anonymously
- Create a web platform where people can report and learn about incidence of violent crime
- Determine a way to crowd source key information about violence and trauma that is not currently being tracked

A total of three problems were addressed after the following section of the Big Think session as we broke into two small groups to brainstorm – one Spanish-speaking group and one English-speaking group. Elizabeth moderated the Spanish-speaking group and Michael the English-speaking one. Participants were allowed to join the group of their choice for the session. During this session, each group delved into one or more issues to frame the problem. The Spanish-speaking group focused on access to healthcare data whereas the English-speaking group focused on the value of technology in medicine.

The next section of the session involved reporting the findings to the large group. The innovation and creativity of the solutions were noteworthy. The process findings were transferred to a giant post-it note that was placed on the wall and can be found in the Appendix. These solutions were then posted on the wall for group voting.

6.2 COLLECTIVE DECISION MAKING

The conclusion of our session was the presentation of the health informatics solutions to the group. All the symposium attendees voted on the solutions to determine which would be implemented at a hackathon in 2015, prematurely named the Hack4Health in Americas. Each participant was allowed to vote for their top three solutions.

The health informatics solutions in order of popularity included:
1. Creating a website that would compare health plans and services
2. Creating an application that would demonstrate the value of open data to government
3. Creating a crowd-sourced open data platform
4. Creating a question and answer symptom/situation system
5. Creating a reminder system for follow-up meetings to increase communication between doctors and patients and to allow them to share information after a procedure
6. Creating an application that will demonstrate the medical value of technology
7. Creating a registration system for undocumented individuals as defined by the census to prevent their falling through the cracks with Obamacare

7. EVALUATION

An electronic survey was sent to all fifteen participants, of which only 6 replied. Below are the responses to all the questions.

7.1 Please select one value per question. Any additional comments may be entered below in either English or Spanish. Results are displayed in Table 2.

Table 2: Responses to Survey Question 1

ANSWER OPTIONS	NOT AT ALL	A LITTLE	SOMEWHAT	VERY	EXTREMELY	N/A	RATING AVERAGE
How EASY was the registration process?	1	0	1	4	0	0	3.33
How EASY was the submission process?	1	0	0	5	0	0	3.50
How EASY was it to get responses to your questions about either of the two previous processes?	1	0	0	3	2	0	3.83
How HELPFUL was the website for SHILAC 2013?	0	1	0	2	3	0	4.17
If you submitted a paper, did you find the reviews of your paper HELPFUL?	0	0	1	3	1	1	4.00
If you were mentored and allowed to submit your paper as a poster, did you find the mentoring HELPFUL?	0	0	1	3	0	2	3.75

7.2 Did the speakers at the symposium showcase the state of health informatics in Latin America and the Caribbean? Results are displayed in Table 3.

Table 3: Responses to Survey Question 2

NOT AT ALL	A LITTLE	SOMEWHAT	MOST DEFINIELTY	N/A	TOTAL	RATING AVERAGE
0% 0	16.67% 1	33.33% 2	50% 3	0% 0	6	3.33

7.3 Was the brainstorming session successful at identifying pressing healthcare issues in Latin America and the Caribbean? Results are displayed in

Table 4: Responses to Survey Question 3

NOT AT ALL	A LITTLE	SOMEWHAT	VERY	EXTREMELY	N/A	TOTAL	RATING AVERAGE
0% 0	0% 0	33.33% 2	16.67% 1	50% 3	0% 0	6	4.17

7.4 How successful was the brainstorming session in coming up with possible health informatics solutions to problems that were addressed? Results are displayed in

Table 5: Responses to Survey Question 4

NOT AT ALL	A LITTLE	SOMEWHAT	VERY	EXTREMELY	N/A	TOTAL	RATING AVERAGE
0% 0	0% 0	16.67% 1	16.67% 1	66.67% 4	0% 0	0	4.5

7.5 What did you most like about SHILAC 2013?
- The intimate nature of it.
- The interaction among the other professionals that work in similar areas of health in other countries and how they shared problems in common to which one can propose solutions from the discipline of Health Systems or from different disciplines. (Translated from Spanish)
- the program was very good but few participants in broad set of sub-fields and the brainstorming session was very useful (the venue was great!)
- The brain storming session was one of the most interesting due to the different points of view with respect to events in each one of the countries from which the majority of the participants came. New perspectives and possible projects for development were generated (Translated from Spanish)
- Hackathon

7.6 What could be done to improve SHILAC in the future?
- Improve promotion and marketing
- The organization was good in all respects, the only thing was that there needed to be more marketing of the symposium so that more people would join and there would be new perspectives. (Translated from Spanish)
- working groups and invite other organizations to show case their work
- Representatives from the different countries in Latin America should be invited to be able to listen to their ideas about health in each of their different countries to obtain a more global vision of the problems with health in Latin America. (Translated from Spanish)
- Publication in an indexed service/journal. Wider coverage across the Caribbean and Latin America

7.7 The final question asked participants if they would like to participate in the next organizing committee for. Five out of the six students who responded replied yes.

8. CONCLUSIONS

Overall, the symposium was well received. The primary organizer faced several major obstacles, such as having to replace the original keynote speaker (also a Program Co-Chair) because the entire congregation from Chile (a total of three participants) were not able to attend because of a strike at an airport. Fortunately, Dr. Michael Brennan of Second Muse stepped in at the last moment to give an inspiring talk on using informatics to build innovative and collaborative solutions. A second speaker's passport had expired and he didn't realize it until he got to the airport; however, he gave his talk using Google Hangout. The second Program Co-Chair was not able to attend the symposium at the last minute because of being scheduled for surgery. Furthermore, because the symposium was held at such a beautiful resort, half of the attendees came early or left early so the brainstorming session was attended by only half of the attendees.

In the opinion of the Organizing Committee Chair as observed in the evaluation surveys, what set the symposium apart was the afternoon brainstorming session. In fact, the responses to the surveys came only from the participants who attended the afternoon brainstorming session. These attendees were very excited about the possibility of doing a hackathon for health (Hack4Health) in the Americas in Puerto Rico in 2015, and then after experiencing it, bringing that experience back to their own countries for hackathons for health throughout the Americas in 2016.

9. FUTURE PLANS

The future of SHILAC is bright. The program committee is being formed now for SHILAC 2015. One of the primary objectives is to get the papers indexed in PubMed, AMIA, IMIA, ACM, or IEEE. We will, of course, continue with the brainstorming session to decide which problems will be addressed in future hackathons. In conjunction with SHILAC, we will be holding the Hack4Health in the Americas in 2015 in Puerto Rico to work on the solutions proposed in SHILAC 2013. We are currently looking into the possibility of holding other medical conferences/symposiums in conjunction with SHILAC 2015 and the hackathon to bring together medical professionals, policy makers, programmers, artists, designers, marketing specialists, computer programmers, and anyone who wants to improve the state of medicine in the Americas using health informatics under one roof for the hackathon. If you are interested in joining this effort, please email shilac2013@gmail.com.

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