

Promoting Applied Health Informatics: The AHI Bootcamp

H. Dominic Covvey with Shirley Fenton

Waterloo Institute for Health Informatics Research (WIHIR),
University of Waterloo, Waterloo, Ontario, Canada



Introduction

We have found ourselves in the position of seeing the creation of an Electronic Health Record (EHR) on every Canadian as a key strategic resource for supporting, maintaining and caring for the health of citizens. By EHR we mean a “cradle to grave” record of all aspects of health and healthcare. It is intended to be comprehensive, in electronic form, and highly secure but accessible by authorized individuals. Federally and provincially Canada has already invested billions of dollars towards realizing the EHR and enabling feeder systems to contribute their data to it. As this work has proceeded, it has become clear that Canada has a major human resources (HR) gap that is seriously

impairing the ability to deliver, implement, promote and evaluate needed informatics capabilities that are needed to realize the EHR. This is especially true related to areas such as information management and the complementary factors of technology, including process re-engineering, management of change, adoption management, role and organizational restructuring, etc. Estimates of the number of needed applied health informatics professionals in Canada have ranged from 2,000 to 15,000.



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There are many education and training programs that have emerged in Canada¹ ranging from community college diploma and bachelors programs (e.g., Conestoga College, Kitchener, Ontario), to university-based undergraduate (University of Victoria, Victoria BC) and graduate programs (e.g., Dalhousie University, Halifax, Nova Scotia, and University of Sherbrooke, in Sherbrooke, Quebec). However, in total, these programs produce fewer than 100 graduates per year, and, despite the growth of the number of programs, this will not change substantially for years. In addition, some of the newer programs are facing serious challenges in recruiting students².

We realized several years ago, in discussions that led to the AMIA 10 X 10 program in the United States, that an innovative approach was needed to address the HR gap at least related to Applied Health Informatics (AHI). By AHI, we mean the discipline associated with the selection, delivery, deployment, use and evaluation of ehealth capabilities in the health system. While it was true that there already existed excellent programs and many more were in the process of emerging, we saw the need for efforts that focused on raising awareness of potential careers in this discipline, on stimulating interest in part-time or full-time studies under one of the existing programs and on encouraging a self-directed life-long learning process that might periodically use the resources of these formal programs.

Based on our perceptions of the need for promoting this area as a career choice and on the realities of existing programs, we undertook to develop, under the auspices of the Waterloo Institute for Health Informatics Research (WIHIR), and deploy the Applied Health Informatics Bootcamp. We conceptualized the Bootcamp as a means of raising awareness of AHI, providing a basic level of knowledge for those in information services roles, and introducing individuals to the possibility of a career in AHI in the health system. The Bootcamp is a broad but shallow program that not only does not compete with existing educational offerings at colleges and universities, but, in fact, aims to promote attendance at these programs. The program is offered in a hybrid on-site and online delivery model.

Bootcamp Development

The Bootcamp was designed to introduce the AHI competencies we defined in our earlier work³.

Our team identified competencies that could be introduced in a relatively short program, focusing on key knowledge needed to function in AHI positions. These competencies were mapped to a set of approximately 60 sessions of duration between one-half and one hour. These brief sessions were intended to be of a duration suitable for adult learning. The number of sessions has been expanded to over 80 to address gaps we perceived and feedback from participants. The program design was overseen by an organizing

committee and is reviewed after each occurrence of the Bootcamp.

To ensure the quality of content, all teachers have been provided with content and presentation guidelines, and presentations must be available for review prior to the sessions.

Program Learning Objectives

Bootcamp “graduates” are intended to be able: (1) To understand the current landscape of the practice of Applied Health Informatics; (2) To better determine and define their own areas of interest; (3) To undertake advanced explorations into their areas of interest; (4) To launch a systematic process of broadening and deepening their knowledge and skills; and (5) To access Health Informatics information resources and training opportunities.

Teachers

Approximately 40 teachers have contributed to the program, bringing expertise in various aspects of Health Informatics from academia, the health system and industry. Bootcamp teachers are selected based on their expertise, experience, and presentation skills. The majority of speakers are selected from the local region where the Bootcamp is offered.

Program Audience

This program is intended for the following types of participants: (1) Healthcare providers (e.g., physicians and other clinicians interested in becoming involved in AHI); (2) IT Professionals in health organizations; (3) Community College and Secondary School teachers; (4) Professionals within health sector agencies and services organizations (e.g., government, NGOs, community access centers); (5) Management and staff from private industry; and (6) Individuals interested in obtaining employment in Health Informatics.

No background is assumed, but knowledge of healthcare and of the health system is an asset. The Bootcamp is intended to be the entry point to a career, but it also serves as an opportunity to expand the areas of knowledge of those already in the field but who have not had the opportunity to go beyond a limited scope of endeavor.

Bootcamp Content

The Bootcamp is intended to introduce all key AHI knowledge areas. The majority of this content is available in an online archive. The topics addressed thus far are listed in Appendix 1. At each Bootcamp occurrence, we have added new topics and, if necessary, redone others where the presentations needed improvement. However, more and more of the onsite component of the Bootcamp is being dedicated to issues of local importance and/or to interactive sessions.

The structure of presentations has been standardized with all sessions adhering to the following session

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structure: (1) Motivation for addressing the topic and its importance; (2) Outline of the sub-topic contents of this session; (3) Brief overview of each selected sub-topic, including the definition of key concepts and the identification of experts; (4) Reflections and insights; and (5) A list of resources for further learning including key experts, websites and literature.

Bootcamp Format

The program has 2 components, the onsite sessions and the online sessions. The program has been developed in a way that has permitted the gradual reduction in content delivered onsite, while expanding the amount of material that is available online.

Each presentation has a didactic component, an interactive component, such as a case presentation and analysis, or an exercise, and a question and answer period of 10 – 15 minutes.

The first occurrence of the program was a 5-day onsite program, while the second and third occurrences were of 4 and 3-day durations, respectively. Future instances of the program will have a two-day onsite duration with about 80 hours of online material derived from previous sessions. In a recent program, in co-operation with the University of Alberta (Dr. N. Shaw) and the Northern Alberta Institute of Technology (Mr. R. Stumbur) we added a third day that allowed teams of students to participate in one of 6 projects, which used tightly-defined templates and were completed and presented by team leaders on site near the end of the program.

Online materials are served from a website to which each student is given an identifier and password. The materials are available at several levels of video resolution to allow access by both high and low-speed connections. These archived materials can be reviewed by students at any time. Periodic question and answer sessions are provided by webcast and videoconference to allow students the opportunity to clarify their understanding of the materials.

Through the use of the online component, we have been able to reduce the fee per hour of content from approximately \$25 to \$15 Cdn. per student, and this is being further reduced as we progress.

Program Attendance

Approximately 240 individuals have participated in the 3 occurrences (Waterloo and Toronto, Ontario, Edmonton, Alberta) of the program up to March 2007, with another 150 expected in 2007. An evaluation has been performed of each offering of the program, revealing a high-degree of participant satisfaction. Our

experience with the Bootcamp indicates that it was much-needed and that it has initiated individuals into a life-long learning process and a given them the desire to interact with the community of people involved in this area.

Evaluation:

Student Evaluation: We have used pre and post-tests to assess learning in two of the sessions. This is currently in the process of being revised with the assistance of an e-learning expert. **Program and Teacher Evaluation:** A detailed evaluation form is completed by each participant for each teacher and module of the program, and an overall evaluation form is completed by participants at the end of each component of the program. These forms also elicit specific suggestions regarding improving the program. Each faculty member receives a detailed report on his/her performance and how he/she compared to other teachers.

Accreditation

Continuing Medical Education accreditation was received for the two Ontario programs. Accreditation by nurse and technologists' associations is currently being pursued. In addition this program is being prepared for submission to AMIA for accreditation as a 10 x 10 program.

Acknowledgements

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APPENDIX 1:

Summary List of Bootcamp Topics

1. Overview of Bootcamp Objectives.
2. Nature and Components of the Bootcamp Program.
3. Health Informatics: A Bootcamp Perspective.
4. The Structure of the Healthcare System and Its ITC: From National to Institutional.
5. Health, Healthcare, and their Challenges for Health Informatics.
6. Canada Health Infoway and the Federal E-Health Strategy.
7. A Perspective of eHealth in Other Countries.
8. A Critical Perspective on eHealth Strategies.
9. eHealth Infrastructure.
10. The Nature, Structure, and Management of Health Data, Information, and Knowledge 1.
11. The Nature, Structure, and Management of Health Data, Information, and Knowledge 2.
12. Human/Social Aspects of Health Information Systems 1.
13. Human/Social Aspects of Health Information Systems 2.
14. Applying Health Informatics 1.
15. Applying Health Informatics 2.
16. Major Healthcare Applications 1: Information Systems.
17. Major Healthcare Applications 2: Digital Imaging and PACS.
18. E-Laboratory/Pathology & E-Drug/Pharmacy.
19. Nursing and Information Systems.
20. Physicians Office Systems.
21. Physician eHealth Strategy and Implementation.
22. Participant Vendor-Based Case Studies: Overview.
23. Systems Support for Public and Population Health.
24. Systems in Community and Home Healthcare.
25. Informatics-Enabled Community and Home Care.
26. Sharing Patient Information within Primary Care Network Teams.
27. Mental Health Informatics.
28. Information Systems and IS HR.
29. Health Communications Systems and Telehealth.
30. Telehealth Strategy and Progress.
31. The Health User Interface and Interactive Systems.
32. "Intelligent" Health Systems.
33. Networks.
34. Evaluation in Health Informatics.
35. Managing Risk in the Digital Enterprise.
36. Privacy, Ethics & the Law.
37. Quality Assessment and Improvement Support.
38. The Critical Nature of Health Informatics Relative to the Quality of Care.
39. Patient Safety.
40. Introduction to Bioinformatics.
41. Translational Bioinformatics.
42. Procurement.
43. Industry-Institutional Partnerships.
44. Project Management.
45. Workflow Representation and Evaluation.
46. Standards and Best Practices.
47. Health Informatics Education.
48. The Health Informatics Professional.
49. The Future and Persistent Issues in Health Informatics.
50. Key Personal Skills for Applied Health Informatics.
51. Continuing Education and Maintenance of Competency.
52. Completing the Bootcamp: Accessing Online Resources and Discussions.