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Leveraging technology to support HELINA Education Working Group activities

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Abstract. Background and Purpose: Working groups implementing activities for health informatics associations need the right technological infrastructure to support the range of activities they conduct. In this paper, we describe the approach taken and results achieved in developing the technology-based infrastructure to support HELINA Education Working Group activities.
Methods: Technological infrastructure needs for the EWG were guided by work sets for the WG. In collaboration with the technical team, the technology tools were identified with a bias towards opensource tools. The waterfall model was used for the development of needed features.
Results: Tools implemented to support the HELINA EWG included a website (*HELINAnet*), a discussion forum (*HELINAtalk*), an eLearning and content organization platform *(HELINALearn), social media accounts (Twitter, LinkedIn and Facebook), a* video conferencing platform based on Zoom, an email-based google mailing list (helina-ewg@googlegroups.com), and an electronic newsletter. Metrics of use were maintained.
Conclusions: The approach taken to implement the technological infrastructure to support EWG activities can serve as a demonstrative model that could be employed by other HELINA WG, as well as the larger organization.

Keywords: Health Informatics, Education, Working Group, Technology

1. Introduction

Health informatics (HI) is "the interdisciplinary study of the design, development, adoption, and application of information technology (IT) innovations in healthcare services delivery, management, and planning" [1]. As countries begin to embrace HI, robust country-, regional- and continent-level organizations and associations have emerged. These organizations support systemic advancement in the field and provide the networks needed to build HI communities of practice by promoting interaction among professionals within the field. Further, they enhance use of evidence-based approaches for digital health interventions to improve health outcomes for individuals and populations, while facilitating dissemination of practical and relevant knowledge to professionals and stakeholders.

Examples of large and well-established HI organizations across the world are: (a) the American Medical Informatics Association (AMIA) [2]; (b) American Health Information Management Association (AHIMA)[3]; (c) Asia eHealth Information Network (AeHIN) [4]; (d) Pan-American Health Organization (PAHO) [5]; and (e) the International Medical Informatics Association (IMIA) [6]. In Africa, the Pan-African Health Informatics Association is the IMIA-affiliated HI association that supports the regional HI

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associations. Established in 1993, HELINA subscribes in full to IMIA's vision that "there will be a worldwide systems approach for healthcare" [7]. HELINA aims to promote African countries to develop National Health Informatics Societies, develop education and research programs that are within the African context, and support sustainable development of HI and eHealth in Africa. HELINA is made of member-country HI organizations, including: Botswana, Burundi, Cameroon, Ghana, Ivory Coast, Kenya, Uganda, South Africa, Mali and Rwanda. Corresponding member country organizations include: Algeria, Benin, Democratic Republic of Congo, Guinea, Madagascar, Senegal, Tanzania, Zambia, and Zimbabwe.

As of 2021, the Education Working Group (EWG) was one of the most active working groups (WG) in HELINA. This WG brings together members from HELINA countries with an interest in education and capacity-building in HI for the African region. To meet the WG goals, the EWG needed robust mechanisms to support its key functions and activities. Among the functions were: (a) robust mechanisms to engage country partners and working group members, (b) easy mechanisms to curate knowledge-bases to enable organization of content relevant to HI in Africa, (c) platforms to allow information sharing with members, and (d) mechanisms to support networking among members. Unfortunately, adequate infrastructure to support these activities did not exist, for example the organization website at the time, was purely static with no interactive features such as news feeds, upcoming events, online conferencing resources and dynamically generated content. In this paper, we describe the approach taken and results achieved in developing the technology-based infrastructure to support HELINA EWG activities. The approach taken can serve as a demonstrative model that could be employed by other HELINA WG, as well as the larger organization.

2. Materials and methods

2.1. Defining HELINA EWG needs

The infrastructure and technologies needed by the HELINA EWG were primarily guided by long-standing work sets for this WG. Among the key EWG work sets were: (1) supporting development of HI curricula; (2) developing a repository of training materials in HI; (3) compiling a database of HI curricula from Africa; (4) developing a repository of tools to enable the development of curricula at Masters level;
(5) supporting education and training in HI using Web 2.0 technologies; (6) providing free access to events for African HI participants; (7) developing a network of authors within each HELINA country to mentor others in scientific publications in HI; and (7) developing short-term certification programs in HI. With the emergence of the COVID-19 pandemic, it became imperative to support online-based modalities for meeting and education. Further, the EWG needed seamless synchronous and asynchronous modalities to share information with its membership.

2.2. Identifying needed technologies

A pragmatic approach was used in selecting the technologies to be implemented to support the outlined activities of the EWG. This approach aligned with the first five steps for technology selection defined by the Digital Clarity Group and others [8]. These steps included: (1) validating the need – done consultatively with EWG members, (2) compiling requirements – guided by identified needs, (3) determining focal needs – which involved prioritizing requirements, (4) creating a technology shortlist – with a focus on open-source technologies as appropriate, or those that were well familiar to most HELINA members, and (5) creating a service provider shortlist – for hosting the code repository, project management, and web-based features.

2.3. Development and Implementation of technology

The traditional Waterfall approach was used in developing the technology infrastructure [9]. Once functional requirements and technologies to use were identified, the team embarked on development, testing and implementation of the new platform, using services provided by a collaborating organization with the EWG. Testing and validation of features were conducted first by usability testers and then by the

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EWG member team, with changes made based on inputs. The final infrastructure was then availed for use to support the EWG activities.

2.4. User engagement metrics

There are a number of metrics that measure user engagement. Lehmann et al. categorize user engagement measuring approaches into three groups, namely: self-reported engagement, cognitive engagement, and online behaviour metrics [10]. Moreover, user engagement metrics can indicate popularity (e.g. # of visits), activity (e.g. time spent) and loyalty (e.g. # of returns). We report online behaviour metrics that reflect on popularity, awareness and use of the various technology-based modalities implemented to support HELINA EWG activities. Additional metrics are also provided to indicate activities conducted to promote user engagement.

3. Results

The resulting core technology infrastructure had several key features, with most of the features organized around the HELINAnet website to support EWG activities [11]. Below we describe these key features and how they have been employed by the HELINA EWG and community.

3.1. HELINAnet Website

The EWG HELINAnet website, based on WordPress [12], provides the overall base for the EWG infrastructure. The website's first key role is to provide general information that pertains to the EWG and the larger HELINA (Figure 1) [11]. To this end, HELINAnet outlines the EWG's key areas of focus, selected WG achievements and ongoing activities. The website further provides links to the social media platforms of LinkedIn and Twitter that are used by the EWG as modalities to disseminate information. There is a calendar that is updated with information on relevant educational and capacity-building activities, including conferences, paper submission deadlines, and webinars, among others. In addition, HELINAnet has functionality to support short articles, via blogs. HELINAnet is currently translatable from English to Portuguese and French to support French and Portuguese-speaking members. Security to the website is provided using a Jetpack service that includes Akismet anti-spam application, as well as VaultPress for backup and security

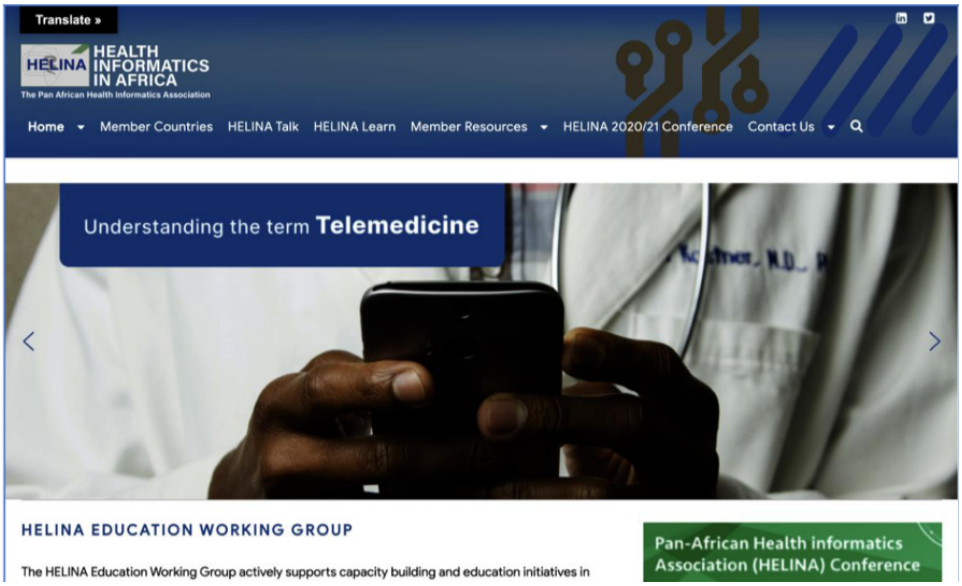

Figure 1. Screenshot of part of *HELINANet* landing page

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3.2. *HELINATalk* Discussion Form [13]

To support active yet asynchronous communication of members while maintaining active engagement, we implemented an online forum based on the opensource Discourse platform [14]. Discourse supports easy assignment of roles, including support for moderated discussions. It allows members a chance to self-register, and to suggest and contribute to ongoing conversations (Figure 2).

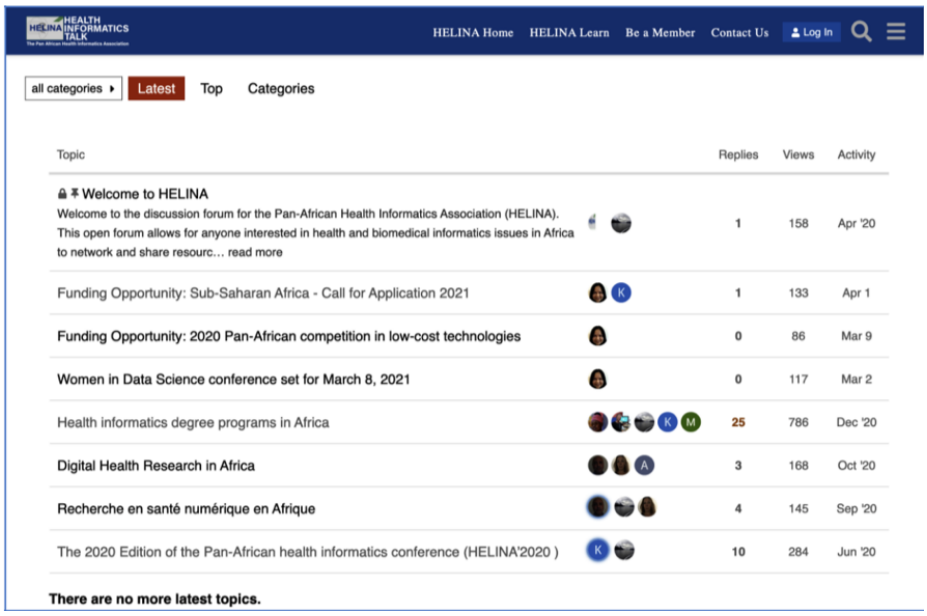

Figure 2. HELINATalk discussion forum screenshot

3.3. *HELINALearn* eLearning and Knowledge Management Platform [15]

HELINALearn is an instance of the widely used opensource Moodle eLearning platform,[16] and is well-suited for organizing content, especially those targeting educational activities. This platform allows for creation of courses, quizzes, and other learning modalities. It also includes various roles and easy organization and re-use of information. The EWG used HELINAnet to organize content in several key domain areas, but these are easily configurable (Figure 3).

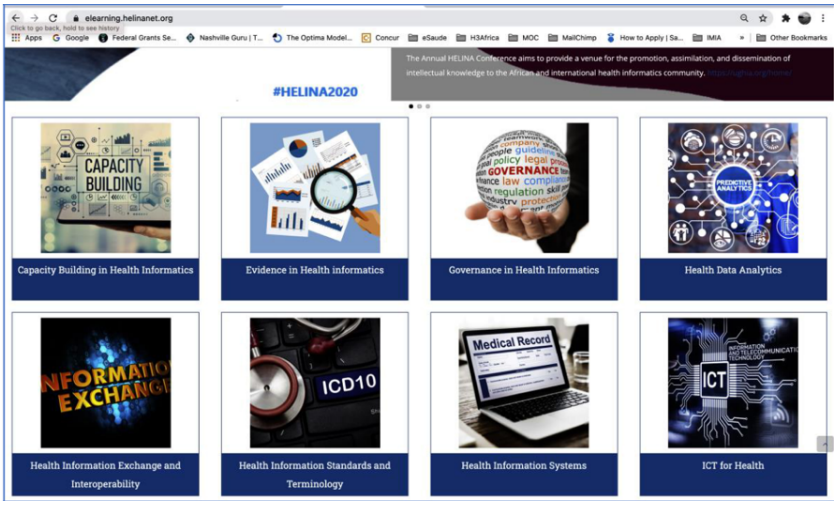

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Figure 3. HELINATalk discussion forum screenshot

3.4. HELINA Zoom conferencing resource

The EWG recognized the need to support synchronous communication for its members, especially in the age of the COVID-19 pandemic where in-person meetings were not as feasible and with the wide geographical distribution of members. In addition, this platform could be used for distance learning and for educational Webinars by the WG. While there was a preference for opensource conferencing system, it was felt that most users were familiar with the Zoom conferencing platform [17], and often already had it installed. As such, this platform was selected for use. The service was availed to EWG members, who could request session slots to use the Zoom platform through the HELINAnet website, with a WG administrator scheduling the meeting on behalf of the requestor. Meetings were categorized as either open or closed, with open meeting details posted both on the HELINA zoom meetings calendar and social media platforms.

3.5. HELINA EWG Google Group

An email-based mailing list, helina-ewg@googlegroups.com, that is based on Google Groups, was created to support mailing to individuals interested in staying abreast of information relevant to the EWG. Through this mailing list, the EWG could share push-based information to members. The mailing list provided functionality for individuals to unsubscribe from it. Deliberate effort was made to limit communication, with most communication disseminated as a bi-weekly newsletter (see VI below).

3.6. HELINA EWG Newsletter

The HELINA EWG newsletter is used to highlight a variety of items of interest, such as: relevant scientific publications and grey literature; upcoming conferences and deadlines and HI job opportunities and grants. The newsletter also invites engagement to members by highlighting how they can directly participate and contribute to the EWG activities and navigate the HELINAnet website.

User engagement metrics.

Most of the features went live in mid-2020. Table 1 provide metrics for the various outlined features between Jan 2021 – May 2021.

Table 1. Metrics for user engagement with technology infrastructure for HELINA EWG

Metric	Feature	Number
# of HELINA Forum users	*HELINATalk*	53
# of discussion topics on the forum	*HELINATalk*	8
# of responses to forum topics	*HELINATalk*	44
# of views on topics on the forum	*HELINATalk*	1,619
# of EWG twitter followers	Tweeter handle: @helinanet	85
# of tweets	Tweeter handle: @helinanet	261
# of content categories	*HELINA Learn*	10
# of members in mailing list	Google Groups: helina-ewg@googlegroups.com,	71

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4. Discussion

Working groups provide the fuel that run activities for HI organizations. However, these WG need to be equipped with the tools to adequately support their activities and members. After identifying gaps in tools available for its needs, the HELINA EWG developed, implements and oversees the continued support of the technology infrastructure it needs. The implemented features are likely not just relevant to the EWG, but can be leveraged by any other HELINA WG, as well as the larger association. This work should thus ideally serve as a model for the larger HELINA organization on what infrastructure to put in place for use by all member organizations and WG participants. In the interim, other HELINA WG can implement the basic components such as discussion forums, mailing lists and social media platforms as they look forward to an integrated technology infrastructure that encompasses all metrics displayed in Table 1.

Developing and implementing infrastructure is just part of ensuring increased and continued engagement in WG activities. A robust dissemination and user engagement strategy is needed, with the associated human and financial resources to ensure that support for creating and updating content is available. The efforts underway to support the HELINA secretariat need to prioritize resources for the technological infrastructure for the organization. Without an active and engaged membership, these organizations will fail in a major mission of ensuring a vibrant community of practice in HI.

The online behavioural metrics used to measure user engagement in this paper reveal increased user involvement over time, but there is still plenty of room for growth. This paper utilized online behaviour metrics to assess the engagement of users in the various platforms. Such metrics will help inform progress in increasing member engagement, and additional ones will likely be needed to support granular analysis of feature use. Over time, engagement of more users will help define additional infrastructure needs, or changes to the technologies employed.

Lehmann et al postulate that although online behaviour metrics provide a sense of user interaction, they do not provide additional information as to why users engage with a particular aspect. Higher numbers usually suggest an indication of more engagement of users. A study conducted by Garett et al. identified 20 design elements that affect user engagement [18] and of these, among the key design elements that affect user engagement in websites that were employed for the HELINAnet website were; (a) content utility; (b) accurate information; and (c) user interaction. Some of these elements are not only applied to the improved website but also to information shared on HELINA social media platforms and the EWG newsletters. As such, it was ensured that content disseminated in the website, social media platforms as well as newsletters was in sync, up to date, useful, interesting, and accurate.

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6. Statement on conflicts of interest

No conflicts of interest were registered

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