Breast Centres Network

Paolo FERRONI[a], Francesca MARANGONI[b, 1], Emanuela GARLASCHELLI[c] and
Carlos GARCIA-ETIENNE[d]

[a] *Eventi Telematici, Sesto San Giovanni (MI), Italy;*
[b] *European School of Oncology, Milan, Italy*
[c] *BCN Consultant, Milan, Italy*
[d] *Humanitas Cancer Center, Rozzano (MI), Italy*

Abstract. Breast Centres Network (BCN), formerly known as SenoNetwork, is the first international network of clinical centres exclusively dedicated to the diagnosis and treatment of breast cancer. It is a joint project between EUSOMA (European Society of Breast Cancer Specialists) and ESO (European School of Oncology) with the aim to promote and improve breast cancer care throughout the world. The network includes Multidisciplinary Breast Centres that fulfil minimum requirements to be considered referral centres. Organisation of Multidisciplinary Breast Units is recommended by EUSOMA, Europa Donna (European Breast Cancer Coalition) and the European Parliament. BCN offers an online Breast Unit Directory: a website that provides detailed information at a glance about the members' centres, in an attempt to broadcast the state-of-the-art international standards for multidisciplinary breast cancer care to physicians and patients.

Keywords. Breast Centres Network, SenoNetwork, Breast cancer, Breast units, Breast clinics, Multidisciplinary breast treatment, Computer generated questionnaire, Data collection system.

Introduction

According to the European Society of Breast Cancer Specialists (EUSOMA), a Breast Unit (BU) is a group of specialists in breast cancer, not necessarily located in a single location, but with independent buildings within reasonable proximity to allow multidisciplinary work [1]. A BU is an organisational model, conceived to improve the quality of diagnosis and treatment of breast cancer. Therefore it is quite important that patients and health professionals could access an up-to-date directory of breast units, listing their available services and features. With this idea in mind, a network of Breast Cancer Centres was established in 2004 (as a non-profit joint project between the European School of Oncology and EUSOMA) today known as Breast Centres Network (BCN) [2], the first international network of clinical centres exclusively dedicated to the diagnosis and treatment of breast cancer. Other websites with similar aims, such as the World Oncology Network [3], CancerIndex [4], and the Italian Sportello Cancro [5] are not specifically dedicated to breast cancer and do not include the detailed information of BCN.)

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[1] Corresponding Author: European School of Oncology, Via del Bollo, 4, 20123 Milan, Italy. E-mail: fmarangoni@eso.net

BCN's mission is both to promote synergism and collaboration among breast units by interconnecting professionals and people working in the field, and to make accessible, and easily comparable, valuable information on breast cancer centres to help patients and caregivers finding the right place for care or for a second opinion.

1. Methods

The BCN directory is organised by geographical areas. Breast centre's description includes four sections: *General information,* including a profile description with overview, picture and address; *Available services,* displayed on a standard descriptive grid that facilitates a quick review and comparison; *Contact details,* providing a comprehensive list of health professionals for each unit; *How to reach us,* where information on how to reach the unit is shown along with an interactive map.
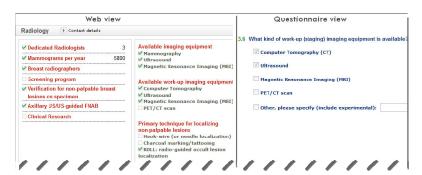

Figure 1. Example of available services as seen on the published website and online form.

1.1. Information Technology Solutions

In order to implement BCN we have developed a software platform, called Qgen, which allows building web-based data-collection systems like BCN. Qgen is made up by three main components: a form builder and configurator, a website to collect data and a web application, called the Query Builder, designed to query and analyse the gathered data. The development of BCN has required the definition of a representational model of a form or, more generally, a data collection system. Such a model accounts for nodes properties, their relationships and performable operations. For instance, a special type of relationship is dependency, which establishes the behaviour of a node, or even a whole branch of nodes, depending on the value of an answer. This model has been our main reference during the development of BCN and helped us to build a consistent system. The creation of a form is entirely made by means of a visual interface representing the form tree. The designer adds a new question setting its intrinsic and visual properties. After completion, the form can be published as a sequence of web pages suitable for the data entry activity.

During compilation, each answer is automatically saved by an Ajax post meanwhile dedicated procedures compute the system state. Once completed, the form

is submitted to the website's administrator, who finally examines and publishes the centre information. The publication process involves the execution of suited transformations in order to display the collected data as web pages. During publication, a classification algorithm runs to assess the centre, compute its membership level and produce a PDF document containing a list of suggestions to improve its overall quality. The Query Builder extremely facilitates data analysis, allowing the analyst to visually build queries on the whole dataset for investigating the information gathered.

2. Results

Currently BCN has 158 Breast Centre Members, from 38 countries, listed in the directory and, every month, receives 5 to 10 new registrations and about 2,000 web-visitors. Since the launch of the new website in March 2010 until February 2012, 77 original units renewed their membership and 81 new centres were approved to join the network, which became "pancontinental" with the approval for membership of four new BUs located in the African continent.

According to the optional question "who are you?" shown in the home page, the proportion of visitors who answered was represented by 48% physicians, 34% patients, 12% non-medical health professionals, and 6% health managers (based on more than 500 answers). These results show the potential of this website as a source of referral for breast cancer care.

3. Discussion

BCN's directory demonstrates the potential to work in synergy against the most common cancer affecting the female population in the world. Channels to diffuse and promote useful information for health professionals and patients represent a paramount aspect in the battle against breast cancer.

The high proportion of patient visitors could suggest the use of this website as a search engine for sources of first or second opinions, especially in close geographical areas. Other potential uses for this network are to interconnect specialists working in the field of breast cancer, to play an active role in the proposal and validation of guidelines, and to foster training activities among centres to ensure scientific updates on breast cancer research. The software framework we have been developing is a key component of the project, enabling a fast, adaptable and quality-oriented workflow from the collection to the delivery of the breast cancer centres data.

References

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