Rheumatology on-line... 7 Years Later

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In June 2001 the then *Revista Española de Reumatología* published the editorial "Rheumatology *on-line*,"[1] which briefly reviewed the history of computing and the internet, its influence in those days, and offered a prediction of its future and importance in academic formation and the daily work of rheumatologists. Allow me to paraphrase the ending of that remote editorial:

"Rheumatologists must confront and reap the changes that are happening and that will continue to happen. Those who do not adapt to change will disappear. Those who do not dominate new technologies will be a functional analphabet. Science fiction? Lets look back 10 years and we will realize the speed with which new technologies change. Times have changed! And will continue to do so. [...] Where does this road lead?"[1]
It is there, where we left off 7 years ago, where we start today.

According to the experts, computing advances in "dog years" or, in other words, every year in computing is equivalent to 7 years in the life of a human being.

The clearest sign that computing and the Internet have modified our lives is the shift in our language. Today, nobody is surprised by words that up until recently would have resulted unintelligible. Who doesn't receive e-mails? Who doesn't have a broadband connection? Who doesn't store files on a USB thumb drive? Who doesn't employ PowerPoint for their presentations? Who doesn't surf the web? And... who doesn't hate their PC when it "hangs"? This shift in the way we speak means that computing, the Internet and personal computers have become something absolutely common in our daily work and entertainment.

What Has Happened in These 7 Years?

Computers are more powerful and less costly, operating systems are "friendlier" and intuitive. Information superhighways are truly starting to seem as such and not roman roads, as was the case in 2001. All of this has contributed to an increased use of the Internet around the globe. It is currently calculated that there are 1244 million persons worldwide who use the Internet, a number that must be taken into account because it represents 18.9% of the planets population.[2] However, this percentage is distributed in an unequal manner throughout the planet and varies from 4.7% in Africa to 70.2% in the United States.[2] As an example, Spain has approximately 19 700 000 Internet users—43.9% of the population[3]—and México, 22 700 000 − 21%[4]−. Use of the internet has increased significantly in the past years; therefore, if we compare the increase in the use in these same countries over the past 7 years we will observe that between 2000 and 2007 the increase has been in the order of 244.7% in Spain and 736.9% in México.[3,4] All predictions are for this percentage to increase, especially in patients with less users.

What Does the Internet Offer Us?

Internet has shortened distances, altered our way of working, and modified the form in which we access information and the form in which we share it. In summary, it has changed the way in which we communicate.

Without looking any further, our journal *Reumatología Clínica* was born thanks to, among other things, the Internet. The editorial group that heads the journal, constituted by rheumatologists from Mexico and Spain, have weekly meetings and work over documents shared in real-time, maintains conversations between all of its members or, in other words, carries out virtual meetings independent of the localization of its members – the day we are able to overcome the different time zones we sill have achieved perfection.

And what about the distribution of *Reumatología Clínica*? Taking into account that the distribution of the printed version of the journal is done mainly among Spanish and Mexican rheumatologists, these are only one segment of our readership, as statistics on readers and the global distribution of our journal show. If it weren't for the distribution of the Journal through the Internet we would reach only a minimal percentage of the current readers (Figure).

Visits

1   10 487

Figure 1. *Sites from where* Reumatología Clínica *is consulted.*

This example serves as a preamble for commenting on the new tools that the Internet offers. It is outside the objectives of this editorial to comment in detail on each one of the uses that will be mentioned below; however, each one will be referenced by a citation where the reader can obtain more information.

Maybe the field in which the Internet has shown more influence in our practice and formation has been the irruption of *on-line* publications. The majority of specialized journals in Rheumatology—if not all of them—publish *on-line* versions, just as *Reumatología Clínica* does[5]; some do it in an exclusive or preferential manner[6,7] others—most of them—merge the printed and *on-line* versions. This irruption of *on-line* publications has led to the appearance of virtual libraries, which makes it easy to access a great amount of information from a personal computer, sometimes freely[8-10] and others by paying an individual or corporate subscription.[11,12] Therefore, currently and given the amount of information available, the most important thing is to have a reliable search and classification system for that information.

If one asks what search engine physicians employ when they want to find scientific information, the answer most of us would give would be PubMed,[13] the free database provided by the U.S. National Library of Medicine and the National Institutes of Health. However, this is not so. The search database that occupies the first place of use among physicians—and therefore rheumatologists—is Google.[14] Google is currently the most employed global search engine, with a market share of 53.6%, and more than 8168 million web pages indexed and over 200 million daily searches.[14] The use of Google before any other database is due to the fact that this search engine includes sources that are not indexed in other databases such as Pubmed. This has reached the point where bibliographic searches cannot be conceived without the use of this search engine—if it's not on Google, it doesn't exist—. However, Google searches used to be inefficient because the pages it fount were ordered by an algorithm which took overall page visit numbers in to account and links from other pages. This problem has been partially solved through the use of a new tool called Google Scholar.[15] It is a specialized search engine that focuses on the academic world. It prioritizes results using an algorithm similar to the one employed by Google for general searches although it adds a signal for "quality," the source of publication. The results also include technical books and links to other articles that cite the article mentioned. This allows us to find new information parting from a known article. Several studies have been published in which an evaluation and efficacy comparison of searches done on Google and PubMed is made.[16,17]

Because of the immense quantity of information to which we currently have access, there is another field in which there have been great changes in the past few years. It is that of web pages destined to offer reviews, comments and continuing medical education to Rheumatologists. In this sense one stands out due to its own merit, Medscape Rheumatology,[18] born of the union of Medscape and jointandbone.org. This web page offers everything from medical news to Continuing Medical Education (CME), ACR, and EULAR congress reviews to expert opinion regarding diverse current discussion topics, from a selection of full-text articles of several publications to links to diverse specialized resources for rheumatologists. In summary, a good place to be kept informed on the most recent news, receive continuing medical education courses and even solve some doubts through a personalized consultation with experts. It is a free resource that only needs previous registration in order to access its full content. Even if, in my opinion, this of one of the best continuing medical formation pages available, it is not the only one and we can find others which also have important information, such as "Rheumatologyweb,"[19] "Doctor's guide,"[20] "Cyberounds,"[21] or "Biocritique."[22]

However, the ease with which information can be obtained through the Internet is not restricted to physicians. Patients are very day looking with a greater frequency to the Internet in search of information about their illness, gathering, and interpreting it, with a series of consequences on the doctor-patient relationship. The most obvious one is that they now have a lot more information than before and that when they come into the office with more information—especially in the case of rare diseases—than the physician might know at the moment, questioning and looking for answers that, probably, might elude the doctor at the moment of the visit and put us in a professional tight spot. Another possibility is that patients self-diagnose—erroneously in most of the cases—and doubt the diagnosis that is being elaborated, seriously affection the doctor-patient relationship; or, because the Internet has no filters, take pseudomedical, or sect-like information on miraculous cures for diseases with limited treatments at face value –one only has to look at the number of pages offering a "complete" solution to fibromyalgia. Therefore, the easy with which information is accessed allows, on the one hand, for a better formation of rheumatologists, but we must know where to direct our patients when they ask for information in order for them to have trustworthy sources and is useful to them, and on the other to treat patients who have taken a "masters" on their disease before coming to their visit.

But the rheumatologist not only lives on information… Work, storage, sharing, and transmitting such information is something basic to our profession.

For that we need a computer and a series of programs that allow us to use it. In this regard there have also been great changes in the past years. The net of nets offers us an immense number of resources—some of them free—that allow us to take advantage of the new technologies.

The resources that can be found on the Internet go from free operating system—software which is freely distributed—, as useful and simple as the proprietary systems—those that have a price or have to be bought before employing—, to browsers and office suites, photograph retouching programs to Internet phone software. One of the programs that have grown in the past years has been Ubuntu.[23] The word Ubuntu defines a South African humanist ideology that can be more or less translated as "I am because you are" or "a person is made human through other persons." A South African company called Canonical® has put the development and distribution of this Ubuntu operating system into effect[24] which in addition to the operating system which allows the computer to work in a manner similar to Windows® or OSX®– includes a series of applications, such as Internet browsers (Firefox), e-mail clients, contact, and address books and office suites (Open Office), in other words, diverse programs that allow the user to take advantage of the new technologies, all of that with the promise that they are and always will be free so that they may reach the majority of the world population.

However, I personally think that the future tendency will be not to have an infinite number of applications installed on our computers but to employ them directly from the Internet. In this manner, with a relatively simple computer and a good connection to the Internet we will always have the latest applications and will be able to reach them from any computer with a connection to the Internet, saving only the results of our work and not the tools we employ to create it.

This is Google's big gamble. Currently it offers users a free office suite that works directly off the net without the need for anything more than a compatible web browser. This proposal, called Googledocs,[25] allows us to administer text documents, spreadsheets and presentations directly from the Internet without the need for an external program. These documents can be exported to multiple formats or even shared and modified by a group in real-time using the Internet—each one of the group integrants can see the document and make changes and see changes made by others in real-time—. Fantastic. And, overall, free. (It's not really free, we must undergo a wealth of publicity surrounding us as a toll for using these services.)

Faced with this new system of work, many software distributing companies—such as Microsoft®—have offered alternative proposals with their own programs (Office Live),[26] but, a previous charge applies.

The last application I am going to comment on, given the usefulness it represents to us, is the Voice over the Internet Protocol technology (Voice over IP or VoIP). It basically uses data transmission nets in order to transmit voice—and images, in the case of videoconferencing—through the computer, allowing us to use it as a telephone. This

facilitates communication at a personal level with minimal charge if we compare it to traditional phone services. It allows us to make group calls, independent of the distances existing between members and facilitates virtual meetings. Programs such as Skype®,[27] Google Talk®,[28] o Windows Live Messenger®[29]—all of them available for free—allow for communication between 2 connected computers, paying only for the connection fee, or to call from our computer to fixed or mobile phones to anywhere in the world at very competitive prices.

Therefore and as a conclusion, the Internet is still growing at a vertiginous course. It is changing our lives. It is altering the doctor-patient relationship. New generation were born under this technology and have incorporated them into their lives from the beginning, with many of them asking how life was possible in those dark days before the appearance of Google.

For those of us who, like myself, have lived through this change, there is no choice but to "adapt or perish" and, as I said at the beginning, who isn't able to adapt will become, or has done already, a functional analphabet.

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