

DERMIS.net – Restructuring the Successful Dermatology Portal

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Abstract

The Dermis.net-service has become the dermatology portal with the highest hit rates worldwide containing more than 10.000 pictures, respective explanations. Several possibilities have been identified to even enhance its usability, presentation of the content for specific user groups, and cooperation with other services.

Keywords:

Dermatology, Portal, Pictures, Web Service, Authoring System, Rating System

1. Prior Developments in DERMIS

The dermatologic DERMIS.net-portal started in 1994 (www.dermis.net, [1,2]). Up to now the following sub-services have been included:

- DOIA (dermatology atlas with more than 4500 pictures)
- PeDOIA (paediatric dermatology atlas with more than 2000 pictures)
- NeurodermIS (neurodermatitis information system)
- Skincancer (Information system about what skin cancer is and how one can protect against it)
- PictureAtlas from Hebra (a historical excursion)
- Cases and lectures

DERMIS attracts more than 10.000 users per month and thus is the most used web-portal in dermatology. To enhance the usability of the system several possibilities for structural improvement with respect to access, presentation, and processing – including authoring and rating of the content – have been identified.

Practitioners provide the pictures by sending the 35mm slides to an external service for digitizing. These digital pictures are transferred into the authoring system for description, classification, and further technical processing. They are both automatically and manually preprocessed and stored in multiple resolutions for the enhancement of the server performance. The details about the requirements for digital images in dermatology can be found in [3]. The information in the current productive system is classified based on the following coding systems:

- Erlanger Diagnosis Code (numerical code with six digits based on and refining ICD-9)
- Diagnosis-related additional key (mainly contains terms which define the grading, staging, type or variant of a disease)
- Skin type (race)

- Set of keys for the description of lesions

The Erlanger Code has been mapped via UMLS[®] to MeSH[®] for the referencing of literature in the PubMed-database. Up to now the DERMIS-service is available in the 4 languages German, English, Spanish, Portuguese. Soon, the Italian language will be included.

The current productive server is based on a Pentium[®] III 350 MHz with 10GB hard disk, Microsoft[®] Windows NT 4.0, Microsoft Internet Information Server 3.0, and Active Server Pages. Microsoft[®] Access database. The former authoring tool (currently used) is based on MS-Access.

2. The New Version of DERMIS

The following possibilities for an enhancement of the DERMIS.net-service have been identified:

- Enhancement of the structural access of the content by including further classifications and nomenclatures and connecting them.
- Revision of the database structure for an enhancement of the performance by separation the authoring system, the output system, the file system containing the pictures, and the management of rights and obligations.
- Enhancement of the layout to provide a better overview and access to the content.
- Switching between the languages in any situation.
- Switching between the classification and nomenclatures in any situation.
- Inclusion of a web-based authoring system.
- Inclusion of a quality management by community management.
- Enhancement of the performance by the usage of modern server technology.
- Transfer of the authoring system to make an ubiquitous usage possible. Inclusion of features for the support of the translation of the content.
- Enhancing the possibilities for referencing of external information like literature, guidelines, Cochrane, etc.

An integration of these improvements suggests a complete revision of the DERMIS-service. The workings have already started and will approximately be finished in Mai 2003. In the following, the situation after the introduction of the new system will be described. The revision of the DERMIS-service will mainly affect the largest picture collections of DERMIS: DOIA (dermatology atlas) and PeDOIA (pediatric dermatology atlas).

Servers

The server system will be based on 2 Pentium 2 GHz machines with a 200GB ATA100 RAID based on Linux, MySQL-database, Apache web-server, and Python scripting language. The next version of the DERMIS-system includes a file server for the storage of the pictures with integrated authoring system and a presentation server for the construction of the web pages based on the structural knowledge related to the pictures (cp. fig. 1).

Fehler! Es ist nicht möglich, durch die Bearbeitung von Feldfunktionen Objekte zu erstellen.

Figure 1: general structure of Dermi.net derived from the MedRapid-project [4,5].

In the following, the services will be described from the point of view of the user roles. Here, editors, the authors, practitioners, and patients can be distinguished (cp. fig. 2).

The community management

Tools are integrated for the support of editors to provide rights and obligations to the authors. If the practitioners or patients experience problems during the usage of the system they can immediately give feedback, which is automatically communicated to the affected author. Like this it is expected to get fast and efficient information about the respective requirements in routine.

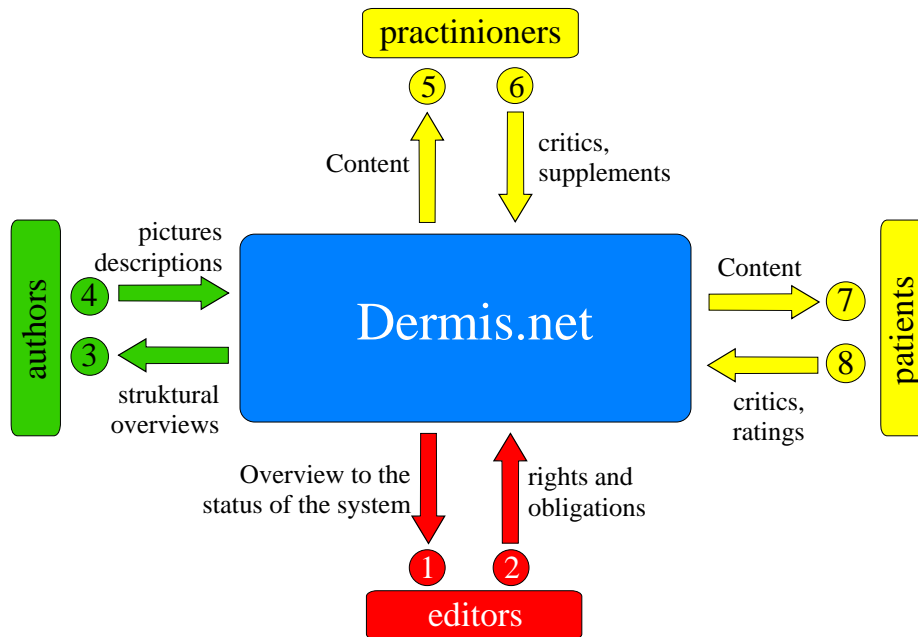


Figure 2: Community management derived from the MedRapid concept [4,5].

Editorial Management

In the new version of DERMIS, the editor will be able to observe and guide the whole process of authoring. The web-based functionality will concentrate on functionality for four aspects:

- Update personal information about the authors
- Set rights and obligations for authors
- Observe the current state of the system
- Observe prior changes in the system

Hence, the editor is an important factor in the management of the system. He allows new authors to access the authoring system and he has to verify the high expertise of the authoring group.

Authoring

The new authoring system will be re-implemented with a completely web-based service. The following functionality will be included:

- Uploading of the pictures from photo-CDs (technician)

- Conversion of the pictures into various jpg-formats (automated)
- Preparation of thumbnails (automated)
- Description of the pictures (medical experts)
- Classification of the pictures (medical experts)
- Linkage of external sources like articles, guidelines (medical experts)
- Translation of the text into other languages (medical experts)
- Anonymization of the pictures (medical expert or technician)
- Sending of messages by the system to possibly affected authors after a change in the knowledge base (automated)
- Verification of information related to the pictures (medical experts)

The transfer of the authoring system and inclusion of a quality management by community management allows enlarging the amount of authors. The separation of the author uploading the pictures and the experts describing the pictures it will be possible in the future to gather pictures from all over the world. With other words, DERMIS will provide a basis for the presentation and discussion of rare cases in dermatology.

Output

The existing web-based output-system will be revised to enhance the structural overview to the pictures. Therefore, the structural depictions and the classifications will be shown at any time to ease both the navigation in the large picture database and the access of external sources. In future, it will be strived to change the navigation structure (e.g. from ICD-9 to ICD-10) as well as the language (e.g. from German to English) any point on the fly (cp. figure 3).

The possibilities for the navigation within one picture will be improved for the user to see details in spite of the little resolution of computer screens. Features for the rating of the content can be charted to hit rates. There from, further information can be concluded about the quality of the content provided by each author.

If these services have proven to enhance the usability of DERMIS, further services can be added. E.g. an automated quiz can mediate the information based on an intelligent agent navigating through the structures of the system. Such an agent could also be used for the training of practitioners in CME-services. A connection to the MedRapid-service (online-system for the authoring and mediation of medical reference knowledge, [4,5]) can support the structural access to the content of DERMIS and will lead to a highly structured mediation of the content about dermatology.



Figure 3: prototypical interface for the restructured version of DERMIS.

In the near future, the machine support for quality management will be extended to enhance the information exchange between both the research community and the external users.

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