landmand.dk
- a personal portal for farmers

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Abstract

About 75\% of the Danish farmers have access to the Internet, and there is an increase in the activity on sites offering information and services to the farmers. However, being a typical farmer, it is a time consuming exercise trying to utilise the possibilities on the Internet. To solve this problem, Danish Agriculture, Danish Agricultural Advisory Services and the publishing house Danish Agriculture Media joined forces to develop a portal for farmers. The portal – which was launched in April 2005 – is free to use for approx. 40,000 members of Danish Agriculture and offers extended possibilities for personalisation of a "My page" section.

Key words: Personalisation, portal, farmers, Internet.

1 Introduction

In April 2005, Danish farmers got another offer on the Internet namely landmand.dk, which is a portal with personalisation features. To clarify, that landmand.dk is more than just smart buzz words, it is necessary to give some background information.

There are approx. 45,000\footnote{Approx. 22,000 of these are full time farmers with 5.700 specialised in dairy production; 5.800 in pig production and 5.800 in plant production.} farmers in Denmark (2004 census) – 38,500 of these are members of the organisation Danish Agriculture. The object of Danish Agriculture is to handle the interests of Danish farmers – i.e. professional, political, social or cultural interests. The organisation works for all farmers, irrespective of farm size, branch of production or special fields of interest.

Danish Agriculture works through three bodies

- The secretariat in Copenhagen, which focuses on political and organisational issues,
- Danish Agriculture Media, which publishes “LandbrugsAvisen”, the largest weekly farming newspaper in Denmark,
- Danish Agricultural Advisory Service (DAAS), National Centre in Aarhus, Jutland, which is one of two levels in a unique advisory system where the farmers are both the owners and users of this system.
The primary task of DAAS is to provide technical know-how and service to about 60 local advisory centres which are located throughout the country. These centres, which are owned and managed by the local organisations, give the farmers advice on biological, technical, economic, educational, IT and social issues. In this two-level advisory system DAAS plays the part of a development centre, and it serves as an "advisor to the advisors" and utilises the Internet based information database LandbrugsInfo (Hansen & Hørning., 2001; Hansen 2004) for this purpose.

The secretariat of Danish Agriculture has a web site; “LandbrugsAvisen” has a web site; there is LandbrugsInfo which also are accessible by farmers and also most of the local advisory centres have web sites. In the end, development and maintenance of all these sites, is paid by the farmers.

Farmers do have access to the Internet (see table 1) and they use the Internet in relation to their farming. There is however, a disproportion between the information and services offered to the farmer and the amount of time he is able to spend in front of his computer. Especially, when considering that most farmers are not experienced Internet users. Therefore, just finding the relevant information and services is an error prone and time consuming task.

To solve this and rationalise Internet presence of the different bodies under Danish Agriculture, it was decided in 2003 to develop a common technical platform, which would include a portal with personalisation features targeting the needs of farmers.

The internal objective of landmand.dk is to present and promote services from Danish Agriculture and this is communicated externally with a tagline saying landmand.dk “- makes it easier to be a farmer”.

Table 1. Access and usage of the Internet among Danish farmers. Results of a survey Spring 2005 with 3,592 responses among members of Danish Agriculture. For comparison, the number in parenthesis shows the values for households in Denmark.

<table>
<thead>
<tr>
<th>Access to the Internet</th>
<th>72% (86%)¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Has Internet - uses it for farming/business purposes</td>
<td>76%</td>
</tr>
<tr>
<td>Modem connection</td>
<td>37%</td>
</tr>
<tr>
<td>ISDN connection</td>
<td>26%</td>
</tr>
<tr>
<td>ADSL connection</td>
<td>37% (36%)²</td>
</tr>
</tbody>
</table>

¹) Statistic Denmark (2005)
²) Eurostat (2005)

2 The development of landmand.dk

The development of landmand.dk was initiated in the middle of 2003 as part of a larger project aiming at establishing a common technical platform for Danish Agriculture. The group at DAAS responsible for LandbrugsInfo was assigned the task of leading the project including the coordination of wishes from the different bodies, the selection of technical platform/CMS and writing a preliminary set of requirements, which formed the basis for a tender. After selecting a company to do the actual development, the DAAS group wrote the final set of requirements and has since then been busy trying to keep the development company on the right track; testing the developed modules and preparing content for landmand.dk.

As landmand.dk is part of a larger project, the resources used for the development can only be rough estimates: Expenses to software is approx. 40,000 € plus Client Access Licences (CAL’s) for all employees in Danish Agriculture. Development costs carried out by external companies are approx. 100,000 €. On top of that comes approx. 5,000 hours used by the project group and other in-house personnel.
2.1 Technical issues

landmand.dk is developed on a Microsoft Sharepoint Server (SPS) platform. SPS offers a number of out-of-the-box facilities, but it is also obvious that SPS has its strength when the users are skilled PC users. Therefore, much effort had to be put into developing a better user interface and shielding the farmers from the more complex possibilities in SPS.

Concerning hardware, the system is running on 15 state-of-the-art HP Blade servers and a common SAN for storage. Most critical servers are mounted in pair for redundancies and load-balance and some servers are clustered to reduce single-point-of-failure. Servers are kept behind security rules with e.g. routers and firewall.

The system is scaled to handle 100,000 registered users each having a personal site and 50,000 page views per hour. This performance has yet to be tested.

2.2 User database

Before landmand.dk all Danish farmers who are members of Danish Agriculture were registered in a database maintained by Danish Agriculture, but the same farmers were also registered in databases at one or more of the local advisory centres.

As a solid user database is a prerequisite for offering personalisation, a new common database was built. Existing databases have been merged into this database, and it is now used by landmand.dk, local advisory centres, Danish Agriculture and LandbrugsAvisen.

The user database holds information about who the farmer is and what he is allowed to see and do on landmand.dk. There are also a number of attributes describing the farmer’s interests and his kind of production system. The latter information will be used to filter information and target new possibilities, when these are developed.

2.3 Content and services

To help establish which kind of content and services would fulfil the objective of making it easier to be a farmer, we asked farmers by using methods of focus groups and card sorting techniques (Maurer, 2003; Nielsen, 1995).

The first focus group did not know anything about our ideas about making a portal with personalisation features. They were asked to tell us about their Internet usage and what they would like to have. Statements like this came up:

- Why do we have to go to so many different sites – I would like to have it “all” on just one page.
- I can’t remember all these passwords. Why can’t we have just one password that is valid everywhere?
- There is a lot of useful information on the Net, and I would like to be able to collect it all on just one page. Even if I would spend half a day setting up such a page.

The second group was presented with a mock-up of landmand.dk including an Excite (www.excite.com) inspired model for personalising their My page. Reactions were positive.

Both groups were given a number of different card sorting tasks:

- With the purpose of clarifying the farmer’s priorities for information and services, they were asked to group approx. 60 cards (cards with graphics in fig. 1) in three groups: What they would like to see on their starting page; what they would like to be able to find on a second level and finally the kind of information and services, they did not find useful. Weather and market information, personal links, a Google search box, early disease warnings and a clipping service delivering newspaper coverage of agriculture were some of the most popular.
With the purpose of uncovering their mental models for how farmers group different subjects, a hierarchical tree with 136 nodes (=menu items) for a fictive advisory centre site was made. The name of each node and a short explanation was written on cards (cards with text in fig. 1), and the participants were asked to sort the cards in groups with related subjects. A cluster analysis on collected data revealed a very clear preference for grouping items by production areas – e.g. extension staff specialised in dairy production should be placed under Dairy production and not under Advisors.

![Figure 1](image)

Fig.1. Examples of material used in card sorting task. Cards to the left for prioritising content; cards to the right for uncovering mental models.

The gained insight was - along with considerations concerning availability of information/services and time and cost for development - used to select content for landmand.dk. An incomplete list is presented here:

- General utilities such as Google Search, address search, etc.
- Localised weather forecasts
- Localised forecasts for grass growth
- Weather observations (soil temp., evaporation, precipitation, etc.)
- Disease warnings
- Important dates (regulations, applications, tax statements, etc.)
- For dairy farmers – comparison of own results with groups of dairy farms
- News feeds from 50 different sources
- Market information
- Feed planning for beef cattle
- Breakeven calculations (Pedersen, 2001),
- Irrigation Manager
- On-line investment calculations
- Variety-Info Database (Jensen, 2001),
- Plant Protection Agent Database
- Danish Field Database / Field Maps Online
- Plant Protection Online (Jensen et al., 2000)
- Access to own data for milk cell count; herd information, medicine usage and milk quota usage (under development)

Static information and tools are typically accessed via a simple link, whereas dynamic content and services are presented in web parts2 allowing the user to get an overview in a quick glimpse.

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2 A "web part" is a modular unit of information that consists of a title bar, a frame, and content. Web parts are the basic building blocks of a My page. A web part is the combination of a web part description file (.dwp) and a web part assembly file (.dll).
3 landmand.dk – user’s perspective

landmand.dk was launched in April 2005. It is designed with five tabbed pages (see fig. 2). There is a general start page that covers common farming aspects, and there are pages targeting dairy producers, swine producers and farmers with arable farming. These pages are business as usual – the site owner decides what to present.
The interesting part is the so-called My page (“Min side”). A user has to identify himself to login to this page. If he holds a full membership of Danish Agriculture, the name of his local advisory centre will be shown – it is "LandboSyd" in fig. 2 – and a web part with logo and contact information for his centre will appear as seen in the upper right corner of fig. 2.

After login his options include:

1. selection of web parts,
2. customization of web parts,
3. selection of navigation elements and customisation of these,
4. establishing single sign on (SSO) to other sites,
5. layout of page(s)

3.1 Selection of web parts

At present, a user has 50 different web parts to choose from and a further 37 are under development. Selecting a web part is done by marking desired ones with a checkmark in a pop-up window which presents all available possibilities ordered in different groups.

It is possible to select several instances of the same web part. By customisation, same web parts will present different content. A My page can hold up to 60 web parts.

3.2 Customisation of web parts

When on the user’s My page, most web parts can be customized using the appropriate tool panels. Examples of customisation include:

- Weather forecast: The selection of the location for the weather forecast by selecting a square on a map of Denmark. Each square covers 10x10 km. Choose the presentation of prognosis for precipitation, temperature, humidity and/or wind speed & direction.
- Daily news: Select between 45 sources of news organised in 11 groups. News from local advisory centres accounts for 21 sources at present. Choose the number of headlines per news source.
- Important dates: This web parts shows, in timely manner, information about deadlines to example for applications of subsidies; tax payments or changes in regulations / restrictions. To avoid cluttering the list, a user can state that he has organic plant production and then this information will be used to filter the important dates, thus he avoids information concerning dairy production or use of pesticides.
- Day calendar: The user enters his postal code, which the system uses to control which times are shown for sunrise and sunset. The user can choose to see only this or also a calendar for the current month showing the week numbers and working days.

3.3 Selection of navigation elements and customisation of these

The left column of landmand.dk is designed to hold a number of web parts with links. This way, the user can build a My page with a left side navigation as is common on web pages. When such a web part is selected, it might show 5-7 links. These links are a subset out of a total that might be as high as 35-40 links. Which links that are presented to the user to start with, is determined by comparing user attributes with information about the links. If the user is not is happy with these, he can open a tool pane and select/deselect links from the complete collection on the specific web part.

3.4 Establishing single sign on (SSO) to other sites

At present, there is only SSO to LandbrugsInfo. The user selects a synchronisation web part in which he
states his login credentials to LandbrugsInfo once. SPS remembers these credentials and takes care of an
auto login to LandbrugsInfo.

3.5 Layout of page(s)

Using standard SPS drag-and-drop, the user can arrange the layout of his My page. There are small left
and right zones; wide top and bottom zones and left middle and right middle zones. Zones adjust to fit the
widest web part it is holding. This means that a user can make a really messy page, but with a bit of care,
it is possible to layout pages fitting an 800x600 screen (avoiding the use of middle zones) and 1024 x
768, (using middle zones but not top/bottom zones).

Navigational web parts cannot be moved away from the left column. The same apply to a web part in top
right corner showing logo and contact information of the local advisory centre, through which the user is
member of Danish Agriculture if he has a full membership.

4 landmand.dk – back-end

landmand.dk is a so-called thin portal. With very few exceptions, content is gathered from other sites –
almost nothing is stored on landmand.dk. A range of methods are used to present content:

- Standard SPS web parts (e.g. web parts for content, pictures, i-frames etc.),
- custom build web parts – often developed in cooperation with the producer of content,
- standard RSS feeds,
- lists residing on and maintained in the SPS environment,
- data collection by using Kapow RoboSuite software (see fig. 3)

Web parts presenting information from Pl@ntInfo (Jensen et al., 2000) are examples of custom build web
parts. In these web parts, code snippets for tool panes are re-use from Pl@ntInfo, and content (data and
graphics) are generated by Pl@ntInfo to suit the needs of web parts on landmand.dk.

Web parts with important dates and navigational web parts get their content from SPS lists through some
custom programming. This makes it very easy to maintain information, and distribute maintenance tasks
between different persons using standard SPS access management.

Kapow RoboSuite (KapowTech, 2005) is especially useful in relation to the sites of local advisory
centres. Local advisory centres want to present their news on landmand.dk, but most of them do not have
the necessary expertise to generate RSS feeds. With RoboSuite, they just have to present news in a
structured layout (list, table etc.), and the robot can be dressed to harvest their news.

![Diagram](image)
5 Experiences with landmand.dk

Prior to the launch, the portal was presented for the public in January at Agromek - the largest annual agricultural mechanization exhibition in Northern Europe – and here it received the prize as the most important new product.

The launch was 1. April, and after 1½ months, approx. 2,500 had registered as users of landmand.dk. The goal is to reach 10,000 registered users after one year. Preliminary log analysis showed around 1,000 sessions per day (week-days) which is satisfactory, as the month of April is a very busy month for Danish farmers.

Initially, some users had technical problems with registering – this has been solved. Another problem, which unfortunately did not come to our attention until after the launch, is a huge overhead of approx. 650 K java script and style sheet files, which SPS has to load for a start. This has partly been solved by using http compression techniques.

6 The future

In its current state, landmand.dk is just the tip of the iceberg, which it will become in the future. The foundation in the shape of the common user database, the SPS framework and strong organisational settings has prepared the road for further development. This will include serving the user his own data from different, already existing systems and a number of small portal residing tools for example electronic versions of compulsory log books for spraying operation and control of crust on manure tanks.

The possibilities for sharing further development with other countries will be investigated. Being based on standard Microsoft software, it should be possible to use the same framework across different countries and languages.

References


