

## Investments in real estates

### Point Of Contact:

Anders Östman, University of Gävle, Anders.Ostman@hig.se

### Rationale:

The Swedish Environmental Protection Agency currently leads a work on national basis; where one intend to streamline management of information of protected areas (VIC Natur). This work consists of two parts, namely one part that applies to the internal operational management of protected areas and a second part that intend to make information public for different groups of users. The latter part of VIC-Natur has several connections to NATURE-GIS. However, these projects are operated completely separate though. Possibly the results from NATURE-GIS can be used in VIC-Natur in a later phase, when INSPIRE has been more well known.

The purpose of this use case is to describe a scenario including value-added services targeted for a public market. The demonstration has been developed at Luleå University of Technology. With this use case we want to demonstrate some advantages that the new standards offers, like chained services, and utilizing different types of data sources such as background information and different thematic information.

### Aims:

The use case that we will present here is about evaluating the suitability of real estates for sale. Today there are several advertisement services available on the Internet where Dagens Nyheter probably is the most well known in Sweden (Dagens Nyheter, 2003). In this service one can search available real estate for sale sorted by county, municipality or part of municipality. Today it is a map engine attached to the service that shows real estate positions on a map. As a prospective buyer on real estate one might be interested in additional information. Such information can be closeness to municipality service (water, sewage, roads, public transport etc) or other areas, closeness to protected areas, more informative background map (especially in rural areas) etc. A web service can be explored either by using special software installed on the computer or using an ordinary web page (usually ASP) that is directly adapted to the web services one wish to use. This web page is then accessed by using an ordinary web browser like Internet Explorer® or similar.

In our User case we have built an application in ASP.NET, which thus is accessible through a web browser. Our demands were to easily be able to:

- seek real estate for sale
- obtain detailed information of these real estates
- obtain real estates drawn on a map
- be able to choose background map, depending on areas characteristics
- be able to choose other thematic information on map, for example protected areas, public service etc.
- obtain detailed information of other occurrences on the thematic layers.

### Addressed users:

The user group addressed here is prospective buyers of real estates, where information

about protected areas may be of interest. Such information may be of value when acquiring forestry land or real estates for recreational purposes.

**Geographic Area:**

County of Norrbotten, Sweden

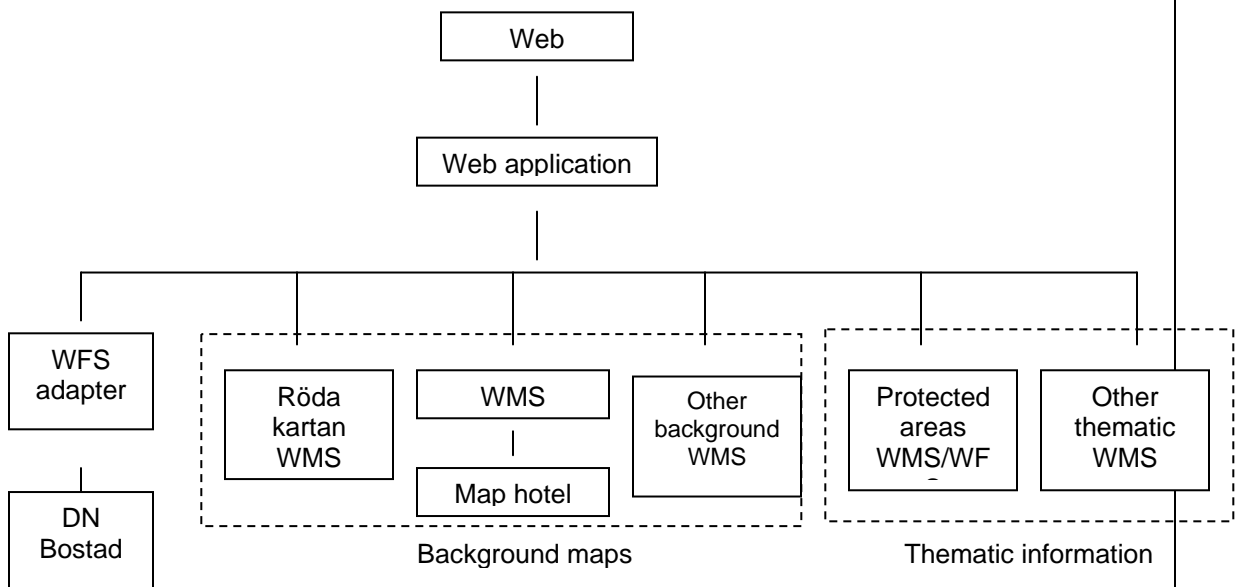
**Data, Feature Types and web services:**

WMS: Topographic map (1:250 000), satellite images (SPOT – 10 m resolution), Community map (1:10 000)

WFS: Real estates for sale, protected areas (with URL to more detailed descriptions)

**Architecture:**

The technical solution is mainly based on using general web services, foremost OGC's WMS (Web Map Service) and WFS (Web Feature Service). Some of the web services that has been used in this application however does not implement OGC's specifications, for instance DN Bostad and other map hotels, why special adapters has been developed that take care of necessary conversions.



**Screenshots:**

The screenshot displays a web browser window with the following content:

- Browser Header:** Opera - Nature-GIS och STRATEGIS. Menu items: File, Edit, View, Navigation, Bookmarks, E-mail, News, Window, Help. Toolbar: New, Open, Save, Print, Find, Holdst, Back, Reload, Forward, Home, Active, Tile, Cascade. Address bar: http://2095.999.999.999/prop61/AA\_osp/WebForm1.aspx. Search: Google search.
- Page Header:** hemnet.se | samarbete med: DN.BOSTAD Nature-GIS Norrbotten
- Property Listing:**
  - Image:** A red house with a white fence.
  - Logo:** HusmanHagberg.
  - Details:**
    - Kommun: Luleå
    - Område: Alvikstråk
    - Adress: Alvikstråk 365
    - Boendeform: Fritidshus
    - Rum: 2
    - Sovrum: 1
    - Boarea: 36 kvm
    - Biarea: 18 kvm
    - Tomtareal: 2509 kvm
    - Pris: 230 000 :- eller enligt ö.k.
    - Ref.Nr.: 33002142
- Map:** A satellite map showing the property location in a green, wooded area. A red dot marks the property. Labels include 'Bålingeberget' and 'Luleå kommun Fritid'.
- Map Controls:**
  - Kartfunktioner:** Zooma in, Zooma ut, Panorera, Identifiera, Kartor (Naturskydd, Satellitbild, Bakgrundskarta, Ekonomisk karta).
  - Kartlager:** bg\_municipal, bg\_lake, bg\_sea, bg\_island\_sea, bg\_city, bg\_railway, bg\_road, prot\_naturreserve, prot\_shore, prot\_biotop.
- Property Description:**
  - Beskrivning:** Fritidshusställe i Alvikstråk. Storstuga, sovstuga och förråd. Vatten från grannen, bastu, öppenspis.
  - INTERIÖR:**
    - Antal rum: 2 varav 1 sovrum
    - Boarea: 36 m<sup>2</sup>
    - Biarea: 18 m<sup>2</sup>
    - Rumsbeskrivn.: Stora stugan: Allrum med trägolv, paneltak samt braskamin. Kök med spis, kyl/frys. Ett st sovrum. Altan under tak. Sovstugan: Hall entré. Toalett med separat. Varmvattenberedare. Bastu med dusch. Ett st sovrum. Förrådsbyggnad. Vatten från grannen. Båtplats vid sjön. Spis, kyl och fry.
  - BYGGNAD:** Byggnadstyp: 1-plans fritidshus
- Additional Content:** A section titled 'FRILUFTSLIV' with a photo of a lake and text: 'Bålingeberget är ett lättillgängligt naturreservat som visar på lämningar från avsmältningen av landisn med stora fält av klappersten, strandvallar som anger havets olika nivåer, grottor och långa sammanhängande erosionskanter som bildats.'

## Functions:

Searching is done through WFS-based services. In this particular case searching is done at DN Bostad, thus the adapter to DN Bostad is used. The response is a list with geographical objects. This means that only the real estate that has coordinates can be used in this application. By clicking a real estate, we pick a URL, that is a web page with further description of objects.

Next step is to choose background maps. The maps which are used in this use case are "röda kartan", any map hotels and a satellite image. Map picture from map hotels is reach through additional special adapters. The other map pictures are generated from WMS-services that are located at Luleå University of Technology.

## URLs:

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## Problems:

The approach of using adapters in order to have existing services to comply with OGC specifications requires a lot of programming, testing and development. The adapters that have developed within this study are, as a consequence, not sufficiently reliable to be used in daily life.

Another problem relates to access rights to information and utilization of third party services. In this specific case, the data on protected areas being used have not been quality controlled in such a manner that the data producer could take responsibility for proper use. In addition, the provide of the DN Bostad service, had no policies for how to treat copyright and other commercial aspects, when their service was used within another context. As a result, the data and the web services can not be made public,

only used as a demonstrator.

**Recommendations:**

The approach of providing value-added services based on WMS and WFS have received great attention and interest, when showed for a wider audience. However, the approach of developing WMS and WFS adapters requires considerable efforts, which might not always be justified.