Numericanal

Introduction
This paper is written from the aspect of recreational boaters across Europe. The author is the owner of a cruising boat (22m Dutch barge), Chairman of the DBA-The Barge Association (DBA) and a member of the European Boating Association (EBA) Inland Waterways Group and has cruised the European inland waterway networks extensively. It considers the 'half term' report posted on the Numericanal web-site and makes some recommendations on information accessibility for recreational boaters. Impressive progress has been made against the objectives and we appreciate the opportunity to comment on the project so far.

Summary
The recreational boater needs simple access to information on safety, regulations, stoppages and navigation conditions before and during their voyage. Additionally, during their voyage it would be desirable if information can be supplied on commercial and other large vessel movements. Although this is available from a number of country specific River Information Services (RIS) most recreational vessels (under 20m) will have only limited access to the principal electronic chart packages. The information needs to be provided by one or more mobile phone apps with a consistent presentation across Europe. Both EBA and DBA would be willing to provide more feedback on specific issues and user testing of solutions.

Numericanal Web-site Project Progress Reports

Analysis of Existing Practices

The analysis has been carried out by looking at the technology used in Germany. There are River information services across a number of other countries including the Netherlands, Flanders, Wallonia and Austria. Both France and UK have web-sites (2 in UK) giving stoppages both planned and emergency and other navigation information such as water-level and stream information. All of these have developed individually with different conventions and varying accessibility. Operating hours and navigation dimensions are also available in a variety of forms. Most of the information is only available in the National language. Although the River

Information Service directive for large waterways (Class IV and above) has produced standard formats and wording for notices and information this has not been followed up in all member states. The result is an overload of available information in varying formats which is difficult to access.

The development of Inland AIS, based on Maritime AIS, and the need for users to display the information on a display screen has pushed users to third party providers such as Tresco and PC Navigo where the agencies sift the available information and provide the results by journey and date in real time. This transfer of data does add to the risk of error but also makes the information available in the mariners' own language. This solution usually requires access to a PC and at least a GPS input which is not appropriate for most smaller recreational craft except in the voyage planning mode at home before the voyage. We can assume, however, that nowadays nearly every recreational craft will be carrying a mobile phone. Any proposed solution must address both Android and iPhone variants.

Most recreational craft will depend on a mix of navigational guides, almanacs and charts and website information for voyage planning – with the inherent risk of conflicting or out of date information. Luckily the biggest risk is to full holiday enjoyment rather a serious risk to craft or crew. It can lead to inadvertent ignorance or confusion of national safety or navigational regulations which could pose a higher risk to the boater.

Connectivity and Regulatory Issues

The part of the Numericanal report only addresses UK issues. To help with understanding of pan-European information I have added more detail on mainland European waterways.

Automatic Identification System (AIS)

This is compulsory for sea-going vessels over 300 gross tons in coastal and tidal waters but is becoming widely fitted in recreational craft, often in the cut-down and cheaper version AIS(B) as an aid to navigation safety. It is compulsory in UK in the PLA Thames area for vessels over 40m or 50 gross tons.
Inland vessels over 20m in length, including recreational craft, are required to have Inland AIS fitted, linked to a suitable plotter (ECDIS), certified, and used on the Rhine, in the port of Antwerp and with extensions to most of the Netherlands, Germany and France planned in the next couple of years.
AIS contributes to navigation safety by allowing boaters to 'see round corners' and into side docks thus warning them of approaching AIS fitted vessels before they are visible.
Internet based sites such as Marinetraffic and Vesselfinder do display AIS information but are dependent on volunteer relay stations and currently lack full European coverage.
Although the UK has no specified River Information Service both the Environment

Agency and the Canal and River Trust maintain websites giving much of the information expected of an RIS but not in the prescribed form.

Other Technology dedicated to Navigational Support
VHF radio is widely used in mainland inland navigation. The RAINWAT agreement governs frequencies and use which differ from sea-going international standards. Requirements for carrying VHF radio vary from country to country ranging from compulsory fit in Parisian waters for all craft to a single radio for craft over 9m in some countries and two over 20m under CEVNI regulations for the whole of mainland Europe.   Channel 10 is widely used for ship to ship communication and other channels in Belgium, The Netherlands, Germany and others to request lock and bridge operation.

Generic Communication Technologies
Mobile Telephone Network
While 3G is widely available and 4G is emerging in UK actual coverage of the waterway network is still patchy due to geography and the separate networks operated by the different providers. France has very poor coverage, mainly 2G, except in the major towns but is jumping a generation to 4G with an extensive planned roll-out but probably not focussed on the waterways! Belgian 3G coverage is similar to UK and in The Netherlands exceptional coverage exists assisted by the lack of hills!

WiFi Networks
Across Europe free wifi is increasingly available but mainly in towns and villages. If this is to be a system for the future then the waterway authorities will have to provide their own hotspots at the points at which they wish to communicate.

Diagnostic and model for the development of the wifi based app systems

 The Netherlands 'Varen Doe Je Samen' ('Sailing Together') Project
The Dutch danger zone information has existed for many years with excellent maps on their web-sites showing how major junctions should be navigated and with aerial photographs to assist the newcomer to the waterway. This project has extended this principal from just junctions to areas of the waterway where there are significant navigational issues or interaction between commercial and recreational traffic. It was disappointing to hear at a recent meeting with the Dutch project managers that little feedback has been received from partners in other countries. While there will not be as many busy junctions there are certainly danger zones and pinch-points where this information could usefully be shared, for example, Seine through Paris, Thames through London and the Thames barrier, major tunnels such as Braunston, Harecastle, Riqueval, and Ruyalcourt. This now needs urgent work across Europe to collect and integrate the danger zone information into a Numericanal information system

VNF Project
The project has an ambitious list of targets but it could be difficult for recreational users to access due to phone coverage limitations described above and the very volume of information planned.

Eijsden-Margreten project
This project has the benefit of being limited to a specific geographic area and the proposed Apps can presumably be linked to a survey to ensure that there is adequate signal coverage. Scaling this up across the waterway network will introduce a need for compatible Apps and a mechanism for informing the boater that the information exists that does not require a computer and a fast datalink. Dedicated free wifi hotspots would assist as most phones will show the hotspots available and if labelled as Navigation Info or Local Info will leap out at the passing boater.

Setting up Cross border wifi based app system for information to waterway users in France.
This part of the project is very ambitious, not because the information is not freely available – most of it can be found on the web if you know where to look! - but because structuring access and search from a mobile phone will have to be carefully designed and there remains the issue of phone signal coverage on the waterways themselves.

Danger Zoning and use of ICT and Apps for waterway safety
The comments above on the Amsterdam project address this part of of the project as well. Numericanal partners do need to provide feedback to Waterrecreatie Nederland for this to move ahead.

Leaflets
The leaflets produced in the Netherlands are first class and are worthy of much wider circulation with local additions and amendments in as many languages as appropriate. The graphic posters produced are seen widely across noticeboards on the waterways and could also be re-launched.

Design and Development of Pilot Control Centre in UK
Remote and automatic operation of locks and bridges exists across a wide range of navigations. A few examples;
 In France the tele-commander, linked to local sensors, is used for local control of locks on a number of waterways.
In Belgium the bridge control through Bruges is centrally managed and operated.
In the Netherlands most of the locks on the Zuid-Willemsvaart are operated and managed from a single control centre.
All of these are backed up by rapid response teams who can attend and deal with failures or emergencies. In heavy traffic areas locks and bridges are always manned to manage traffic flow and ensure adequate safety.

The UK scheme as described is different from all of these and is focussed on cost-benefit solutions to replace bridge or lock-keepers. The solution seems to depend on local wifi hotspots and presumably access will be password protected in some way. The VNF systems are regularly frustrated by boats tail-gating, canoeists exiting locks but not activating the 'close' sensor, and by boaters fooling the sensors by waving frying pans in front of them. Doubtless this can be addressed in the detail design.

Conclusions

The project is making progress towards its current objectives. However from the recreational boaters aspect the principal concerns will be:

Mobile phone coverage. It will improve with time but will not be a phone company priority. The use of specifically provided wifi hotspots would address this. Accessibility of information. Most of the information needed is already available on the web but finding it when appropriate to your country, craft and journey from a mobile phone or tablet will call for very clever search facilities or more extensive use of dedicated hotspots. It should not be assumed that recreational users have PC access and a full suite of ECDIS charts.

Way forward

Both EBA and DBA would be willing to provide more feedback on specific issues and user testing of solutions and answer any follow up questions.

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