

KAPTAN – A smartphone application for mariners

Aldo Drago¹, Audrey Zammit¹, Raisa Tarasova¹, Adam Gauci¹, Anthony Galea¹, Joel Azzopardi²,
Giuseppe Ciraolo³, Fulvio Capodici³

¹ University of Malta, Physical Oceanography Research Group, Dept. of Geosciences (Malta),
aldo.drago@um.edu.mt

² University of Malta, Department of Intelligent Computer Systems (Malta)

³ University of Palermo, Department of Civil, Environmental and AeroSpace Engineering,
Palermo (Italy)

As the CALYPSO Follow On project (www.capemalta.net/calypso) came to completion in December 2015 with the addition of a fourth HF radar station in Ragusa Harbour, another major milestone was being accomplished with the launching of KAPTAN, an integrated service of met-ocean information delivered online and on smartphone to aid sea farers navigating in the proximity of the Maltese Islands and south of Sicily for planning their journeys and ensuring safer trips. The initiative follows the trail of efforts by the Physical Oceanography Research Group (ex PO-Unit) of the Dept. of Geosciences within the University of Malta to deliver services deriving from operational oceanography and meteorology to users, not only at the level of national stakeholders that require data and information for their routine operations, but also to the general public by making use of popular media and affordable smart technologies.

KAPTAN (the equivalent Maltese word for 'Captain' in English), provides an aid to sea farers navigating in the proximity of the Maltese Islands and southern Sicily to plan their journeys and to monitor meteorological conditions in real time for safer trips. Just a few clicks on a smartphone application leads users to a suite of sea and weather data in the form of interactive maps providing instantaneous user friendly and user defined access to prevailing conditions at sea as well as short term past and forecast information.

The data for this integrated service to mariners is mainly derived from the CALYPSO HF radar observing system, consisting of a network of CODAR SeaSonde installations on the northern Maltese and southern Sicilian shores at four selected sites. High resolution weather and marine numerical models run at the University of Malta specifically for the Malta-Sicily Channel together with satellite observations of the area, provide a full suite of very local reporting, and complement other weather forecasts derived from GFS/WRF models and local weather stations.



Fig. 1: Snapshots of the KAPTAN online and smartphone service delivery

The services are delivered on KAPTAN using Google Maps API and are composed of six components: sea surface currents on 2D Eulerian maps; sea surface currents along transects; sea current drift;

Atmospheric forecasts – wind vector, air temperature, precipitation, mean sea level pressure; sea surface temperature - observed and forecast; sea wave conditions – significant wave height, wave direction, peak period and mean period.

When users open KAPTAN, the smartphone device sends requests for data, over an Internet connection, to a Simple Object Access Protocol (SOAP) web-based service. The extraction from the available data sources (observations, models, local and third party) is performed through text files and maps that are generated by dedicated Matlab functions; they contain data belonging to one time frame or a group of related time frames. The file names have a prefix showing the service that they relate to, and a date/time stamp to show the time relating to the data they contain.

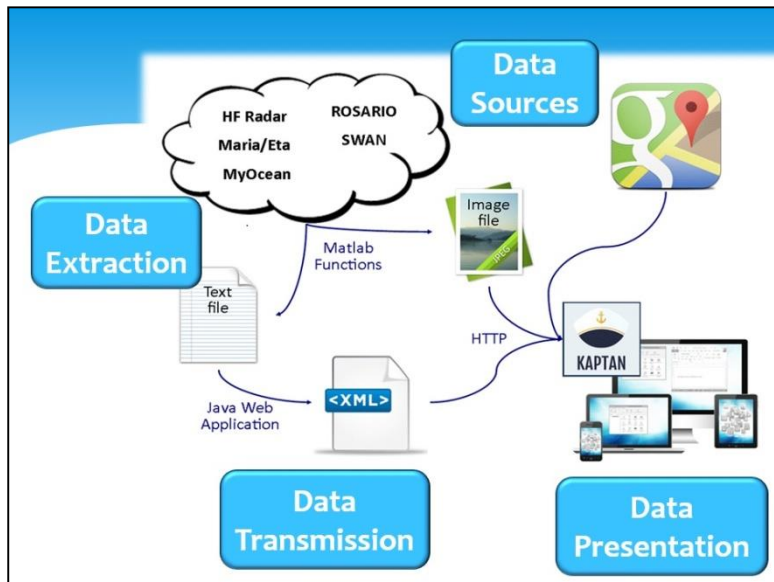


Fig. 2: Schematic of data flow: sourcing and extraction from observing and modelling platforms to data transmission and presentation on the web and smartphone interfaces

All services are implemented as a Java web application. Requests to consume the service are transmitted in EXtensible Markup Language (XML) format using HTTP and include strings carrying the required input parameters.

The KAPTAN smartphone application can be downloaded for free for both Android and iOS devices ([Google Play](#) and [App Store on iTunes](#) respectively). The same services are also available online on

www.capemalta.net/calypso/kaptan.

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