Delivering an operational nowcasting system, lessons from Australia

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Case studies

Off-line forecast engine

- Communicate with key stakeholders and end users
- Develop training material
- Verify the products especially reliability vs ensemble size for cases with intense rainfall
- Early estimates of the computation costs

User requirements

Major user decisions

- Domain size
- Resolution
- Lead time
- Probability product thresholds
- Reliability of forecasts at different rain thresholds
- Number of ensemble members to output to end-users

Prototype real-time forecast engine

Start with the minimum viable product and build out when required

Modify the user requirements or the budget until the computation costs can be met

Need to carefully specify the output format and associated metadata since it is difficult to change this once there are users

Prototype a real-time end-to-end system with an end user

Real-time visualisation for the developers including system dashboard

Going operational

Operational means different things to different people

To the post-doc

- it ran without crashing!

To the senior scientist

- the system is running in real-time on a radar

To the IT professional

- the system is running in real-time on an operational machine with documentation on how to maintain operations 24/7

To the end user

- the system is used for operational decisions, with training, standard operating procedures, and is available on their workbench

Opportunities

Delivering an operational service provides a number of opportunities for personal development

The Practicing Stoic by Farnsworth is a good resource

Finding the right computation platform

- Nowcasts for a couple of radars can be done on a high-end server
- More than that you need to think about parallel computing using cluster, cloud, or super computer
- Super computer is not good at scheduling a large number of 1-3 min jobs
- For 60+ radars in Australia the cloud is used to scale up the number of VMs as the number of radars with rain increases
- Setting up the entire system once you have a working forecast engine requires IT skill and effort- around 6 months for Australia

Opportunities

The project sponsor needs to be a member of the executive who really needs what STEPS can deliver

Getting the support from the executive

- Nowcasting is fully automatic and there may be issues if the forecasters see it as a threat to their existing service
- There will be a temptation to want to commercialise the service, which will delay the project and reduce the uptake of the products
- Need a policy regarding the automatic delivery of STEPS products to external agencies

Opportunities

Use within the NHMS

- Need to develop a forecast process that uses STEPS products to deliver a service
- Need to understand how STEPS fits in with any existing technology, especially object based tracking
- Need to develop a policy regarding the automatic delivery of STEPS products to external agencies

Opportunities

Elvis has left the building

External agencies

- External agencies often need help with getting the data in real-time and adapting their systems to use the products
- Need help with understanding how to best use the products in extreme situations for their business
- Case studies of significant events and workshops

Final remark

There is nothing quite like walking into an operational room and seeing your system being used by professionals to make significant decisions