

MONICA

The importance of testing new and improved public safety and security technologies in real world settings and the challenges this presents to the end-users



Dr Helen Whitrod Brown
Project Co-ordinator

5th June 2019

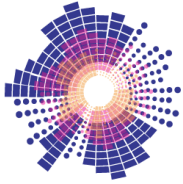
PSCE Conference Lancaster, UK



Co-funded by the
European Union



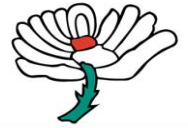
MONICA



Presentation Outline



- Context
- Partners
- Leeds pilot outcomes
- Pilot delivery
- Impact assessment
- Value and challenges
- Lessons learned



Monica is part of HORIZON 2020: €15m; 29 Partners; 9 countries





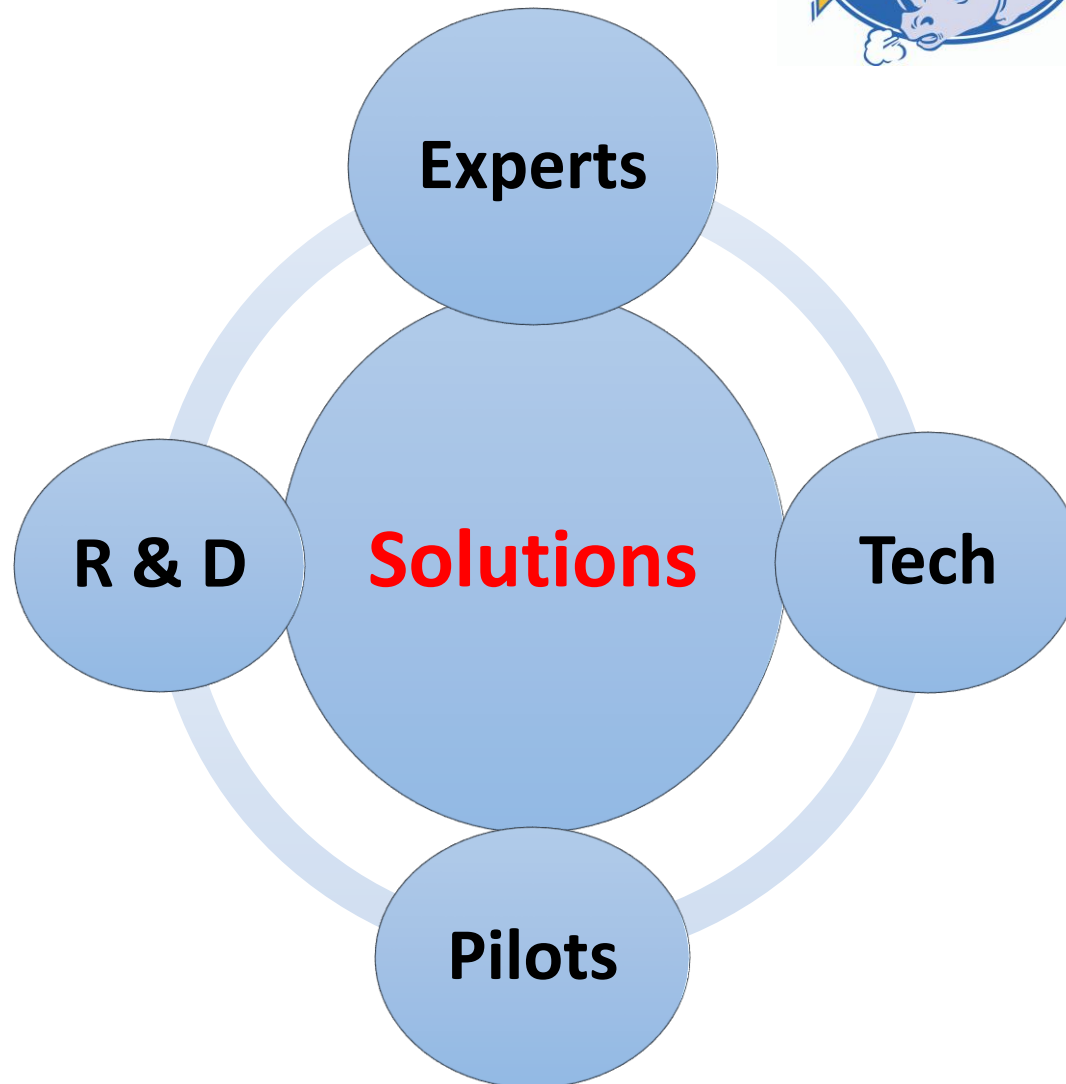
Management Of Networked IoT Wearables – Very Large Scale Demonstration of Cultural and Security Applications

Project aim is to develop new and improved IoT safety and security solutions to improve common areas of concern for large scale outdoor event organisers.

The solutions should be transferable and replicable into other contexts.

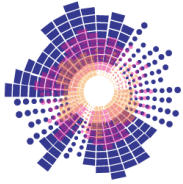


2. Partners



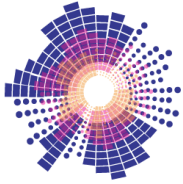


- **Pilot partners:**
- **Copenhagen** - Tivoli theme park and Rock Concert
- **Bonn** - Rhein in Flammen and Pützchens Markt (German Market)
- **Hamburg** – DOM (Public Festival)
- **Turin** - Kappa Futur Festival (techno festival) and Movida (street nightlife)
- **Lyon** - Nuits Sonores (music festival), Woodstower (music festival), Fete des Lumieres (Festival of lights)
- **Leeds** - professional sport (rugby and cricket games)

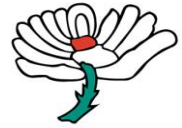


- The areas include crowd and capacity monitoring, incident detection and response time and sound quality and control.
- The solutions include deploying combinations of smart glasses, smart wristbands, sound meters, cameras and APPs
- Solutions provide data flow to the COP providing on screen event management control centre

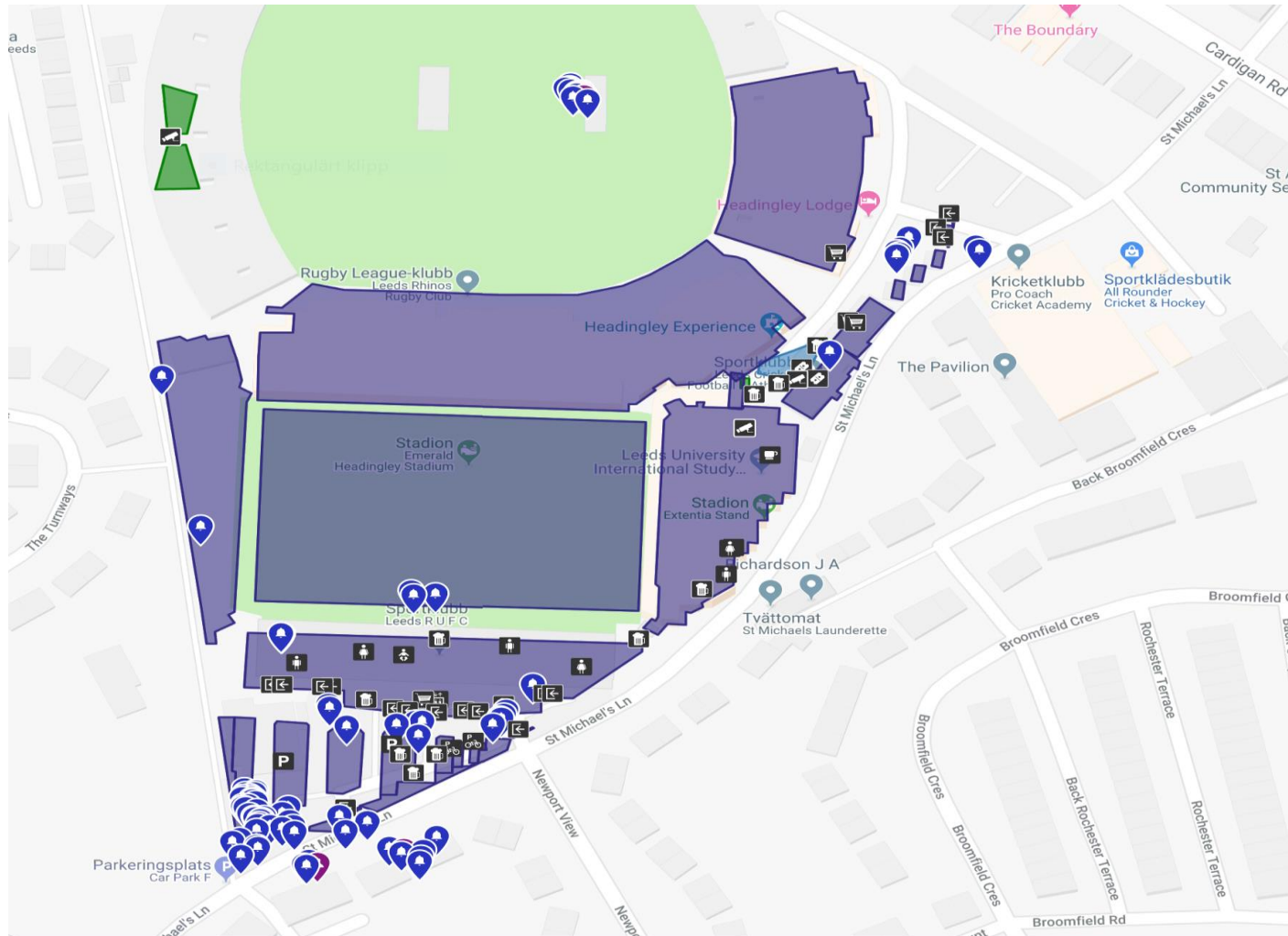


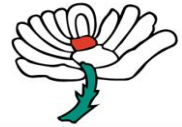


The COP



THE YORKSHIRE
COUNTY CRICKET CLUB





**THE YORKSHIRE
COUNTY CRICKET CLUB**





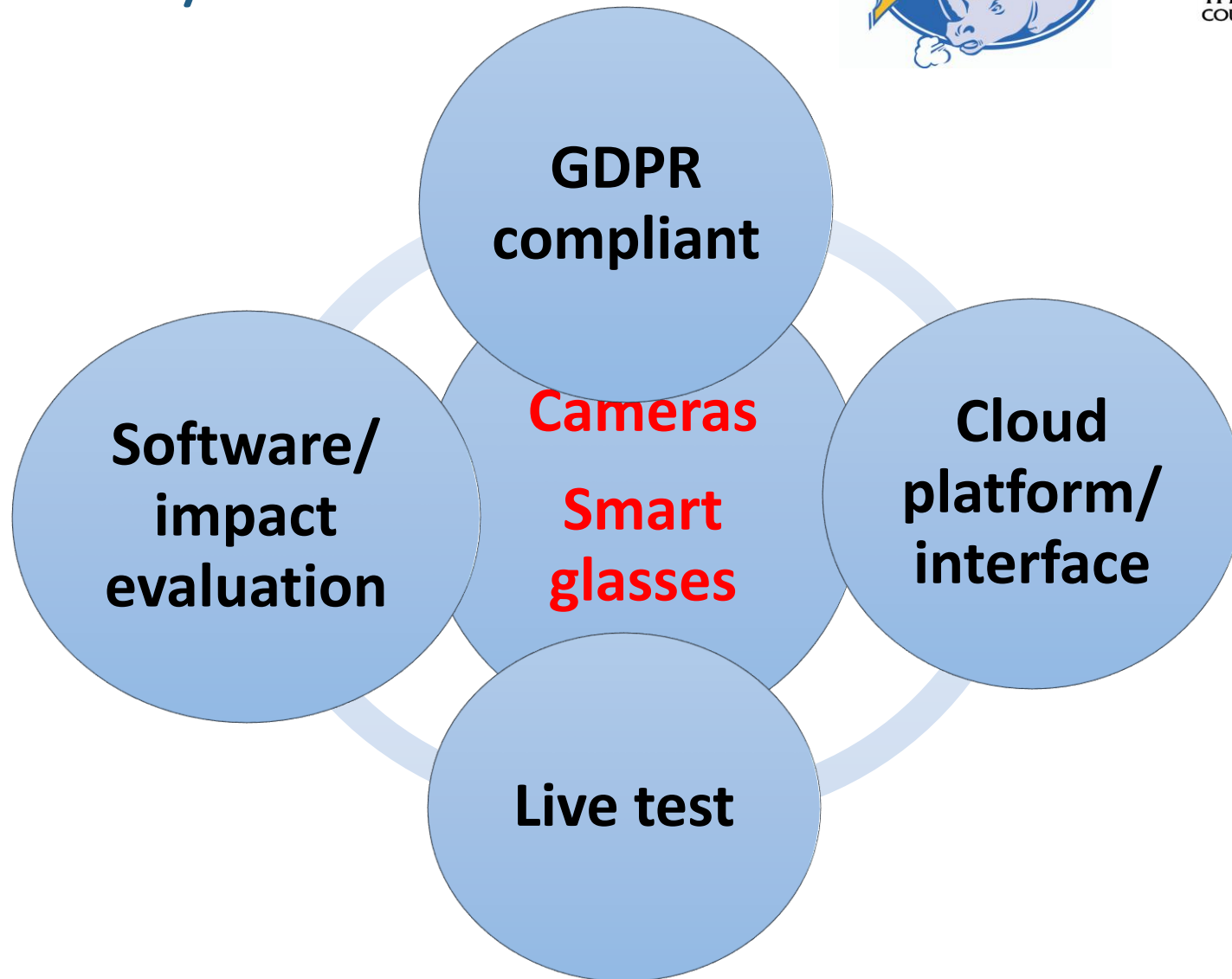
3. Leeds Pilot Outcomes



Outcomes – pilot driven	Solutions – tech driven	Application – Control room driven
Improve crowd congestion / queues	Cameras – algorithms for count / density/	Display on the COP / heat maps/ alert
Improve crowd flow	Cameras – algorithms for flow	Display on the COP / unusual movement alert
Improve incident recognition	Smart glasses Cameras – incident recognition software	Real time images sent from glasses to COP Alert from cameras
Improve incident response time	Smart glasses for	COP alert, control room instruction to stewards
Locate staff	Wristband/ APP	COP s specialist stewards and deploy
Enhance visitor experience	Stadium APP	Incident Information to visitors via APP



Role clarity



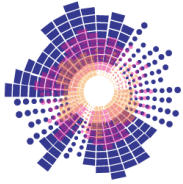


4. Pilot Delivery



Provide a fit for purpose test facility at a large scale outdoor event – rugby or cricket:

- Provide the information and infrastructure for the technical partners
- Ensure validity e.g. -replicate the match day Control room
- Engage security experts in testing the technologies
- Comply with GDPR regulations
- Have a back up plan!



Stakeholder buy in



THE YORKSHIRE
COUNTY CRICKET CLUB

Pilot lead



Pilot lead



LEEDS
BECKETT
UNIVERSITY

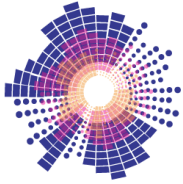
Technical partner



Operations adviser

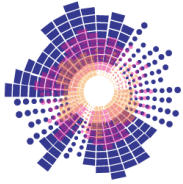


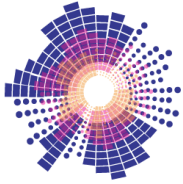
Technical adviser



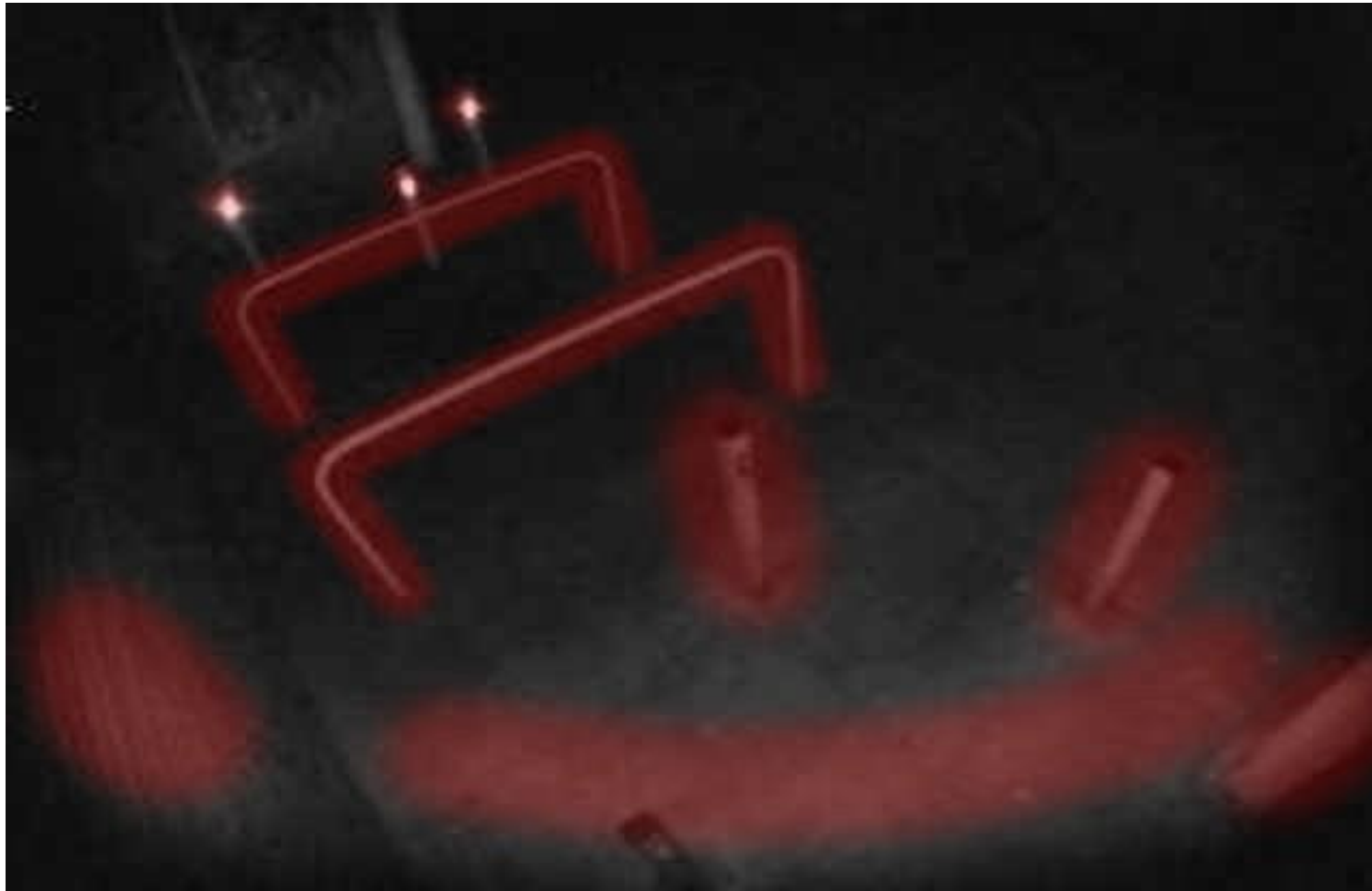
Cameras – where????







IPT camera view – OOPS!





Crowd capacity monitoring



Cameras were calibrated remotely prior to the event.

Initial evaluation shows, the new counting algorithm performs relatively better than the old (last year) algorithm.

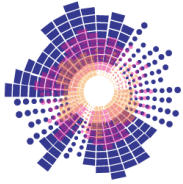
Our evaluation over 10 random sample frames from the pilot shows that we have achieved counting accuracy of ~70 percent.



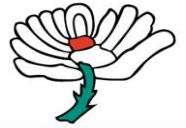
Accuracy: 72 %



Accuracy: 69 %

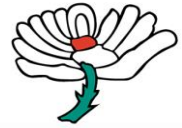


Smart glasses – how???



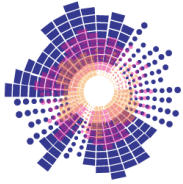
THE YORKSHIRE
COUNTY CRICKET CLUB



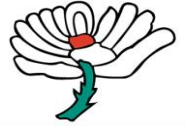


**THE YORKSHIRE
COUNTY CRICKET CLUB**



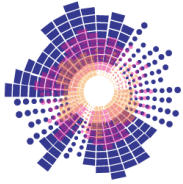


'Dummy' Control room

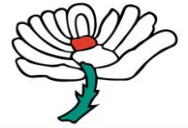


THE YORKSHIRE
COUNTY CRICKET CLUB

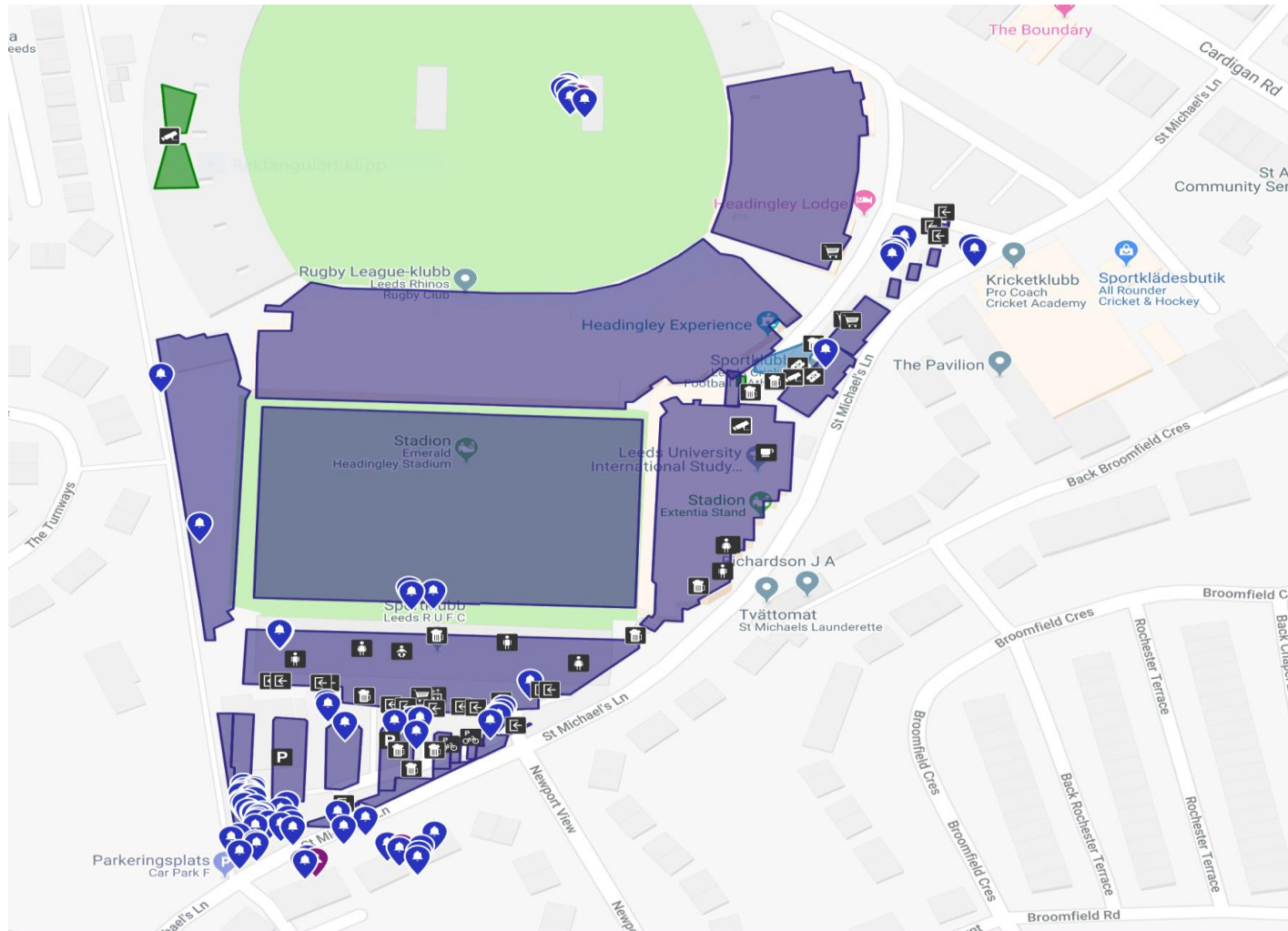


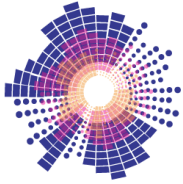


The COP

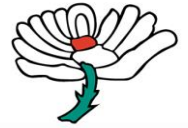


THE YORKSHIRE
COUNTY CRICKET CLUB



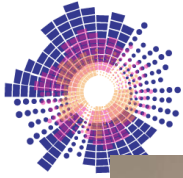


Staff locator and activity

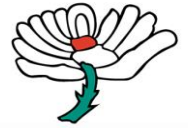


THE YORKSHIRE
COUNTY CRICKET CLUB





Staff locator



THE YORKSHIRE
COUNTY CRICKET CLUB

Location	Name	Status
MONICA	MONICA CREW 2	true
MONICA	MONICA CREW 3	true
MONICA	MONICA CREW 4	true
CREW	George	true
CREW	Isaac	true
CREW	50081806	true
CREW	Obulum	true
CREW	Victoria	true

Items per page: 10 1 - 10 of 21

Zone Capacity
All zones at Leeds

Community Stand (visitors)
Aug 17, 2018, 5:55:39 PM

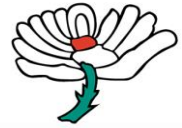
Crowd Incidents
Overcrowd, queues, fights etc.

WHAT WHERE

Over crowded



Images from glasses



THE YORKSHIRE
COUNTY CRICKET CLUB

MONICA Common Op

https://portal.monica-cloud.eu/LEEDS/cop/ui/alerts

HEADINGLEY

Admin

CROWD

ALERTS

STAFF

LOGOUT

Send message to MonicOraGlasses_2

Max. 100 chars

Send

Ogiltig källa

ONGOING

FieldReport: picture from MonicOraGlasses_3 picture

Probability: 1%

Mar 28, 2019, 6:58:22 PM

From: MonicOraGlasses_3

Send message to MonicOraGlasses_3

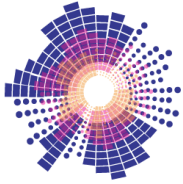
Max. 100 chars

Send

FieldReport: picture from MonicOraGlasses_3 picture

ONGOING

FieldReport: picture from MonicOraGlasses_3 picture



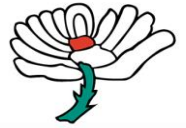
Sequence



- Incident detection via camera recognition or smart glasses
- Steward location via COP
- Steward deployment via smart glasses or radio
- Or request more detail from nearest steward to deploy specialist staff
- Send images to emergency services

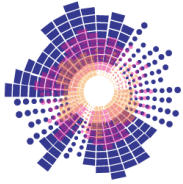


5. Impact assessment



THE YORKSHIRE
COUNTY CRICKET CLUB





Impact assessment – end users



- Helpful in focusing on potential incidents more quickly
- Easy to use and helpful to report incidents
- Could enable Control to deploy nearest 'specialist' to an incident
- Visual feed vital to understand nature of major incident
- Real time messaging and video recording most important features



- **To think about:**

- Weather: (Gloves, Screen)
- Context: Fire fighters, Stewards
- Inclusive – e.g. Font to be bigger
- Safety – side straps/ lenses in glasses

- **Additional Capabilities:**

- Two-way radio communication
- Thermal imaging capabilities
- Typing messages, stored, hanged, WIFI built in



Technical assessment



- Huge number of alerts with video/sound, 100+ - UI not built for this
- Automatic discovery of the glasses worked well
- KML import worked well
- Automatic discovery of cameras did not work as well
 - Lots of cameras in the GOST database for Leeds which seemed to be wrong
 - =>They were manually defined



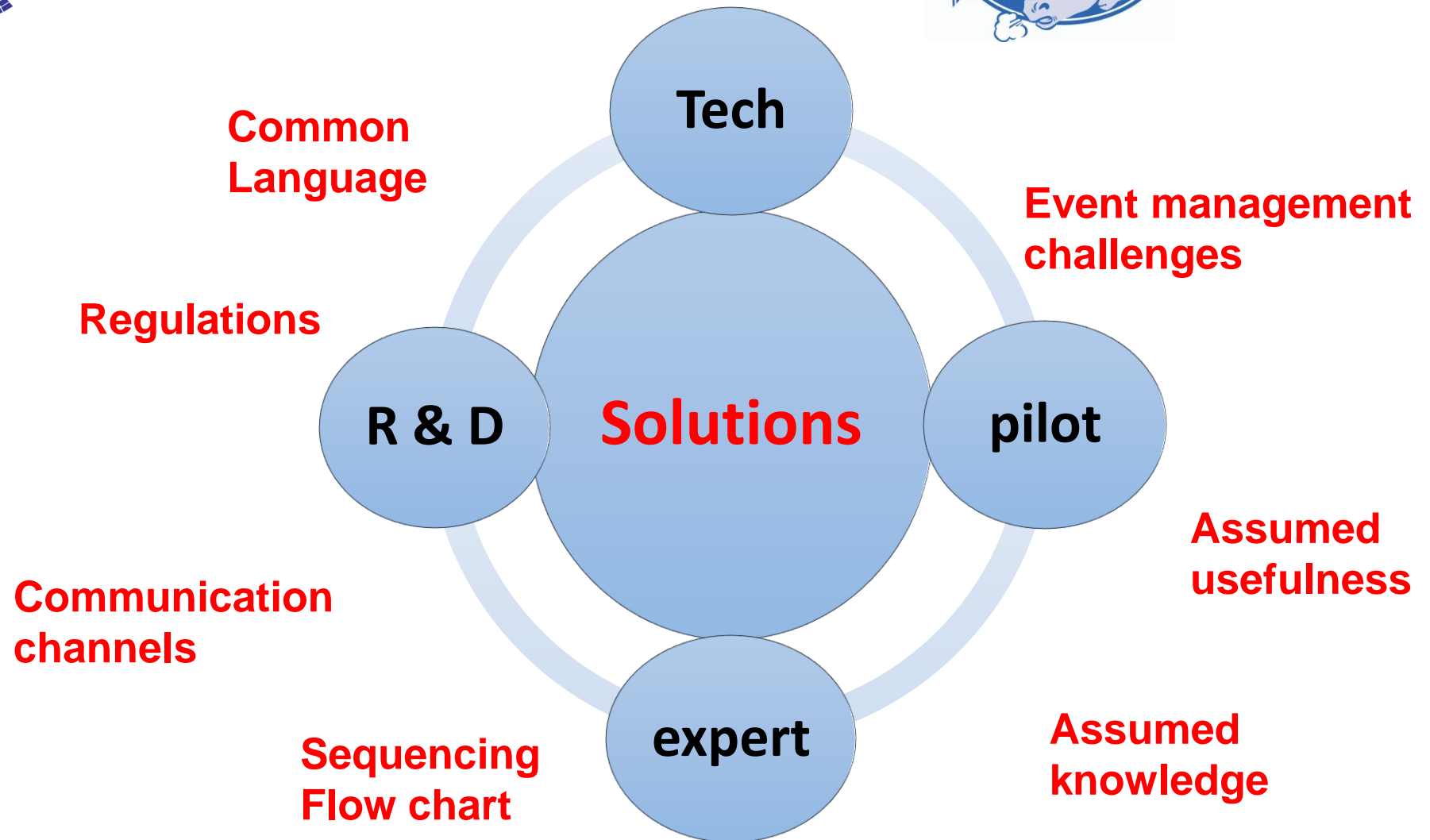
6. Value and Challenges



Value of live pilot	Challenges
Gain 'real' event impact evaluation of solutions	Interference with normal operations
Share knowledge and learning (SWOT/ COP)	Time and priority for event organisers
Qualitative and quantitative data/ valid	GDPR / privacy Valid data collection
Build relationships	Fail to deliver
Improve visitor experience	Engagement of visitors; minimize impact
Prestige/ PR for pilot partner	Not managed



7. Lessons learned





MONICA

Thanks for your attention

www.monica-project.eu

[**Helen.whitrodbrown@yorkshireccc.com**](mailto:Helen.whitrodbrown@yorkshireccc.com)

All rights reserved.

All copyright for this presentation are owned in full by the MONICA Project.

Permission is granted to print material published in this presentation for personal use only. Its use for any other purpose, and in particular its commercial use or distribution, is strictly forbidden in the absence of prior written approval.

MONICA has received funding from the European Union's Horizon 2020 Framework Programme for Research and Innovation under Grant Agreement No 732350.

Possible inaccuracies of information are under the responsibility of the project. This presentation reflects solely the views of its authors. The European Commission is not liable for any use that may be made of the information contained therein.