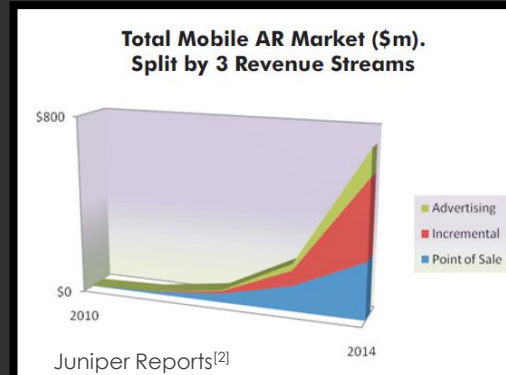


Miru aims to provide a toolkit to enhance human perception and spatial awareness in process industry environments increasing safety, efficiency and accuracy.

The project has a short time scope, but through good design and employment of the DSDM agile model, production of an MVP is expected to occur late February 2014; with implementation on track, to begin December 2013.

Augment This.

- Consumer research shows positive reactions to AR effectiveness^[1], with the AR Market showing an exponential growth to support this^[2].
- AR has been proven to be a highly efficient method for inspection tasks^{[3][4][5]}, increasing productivity and safety.

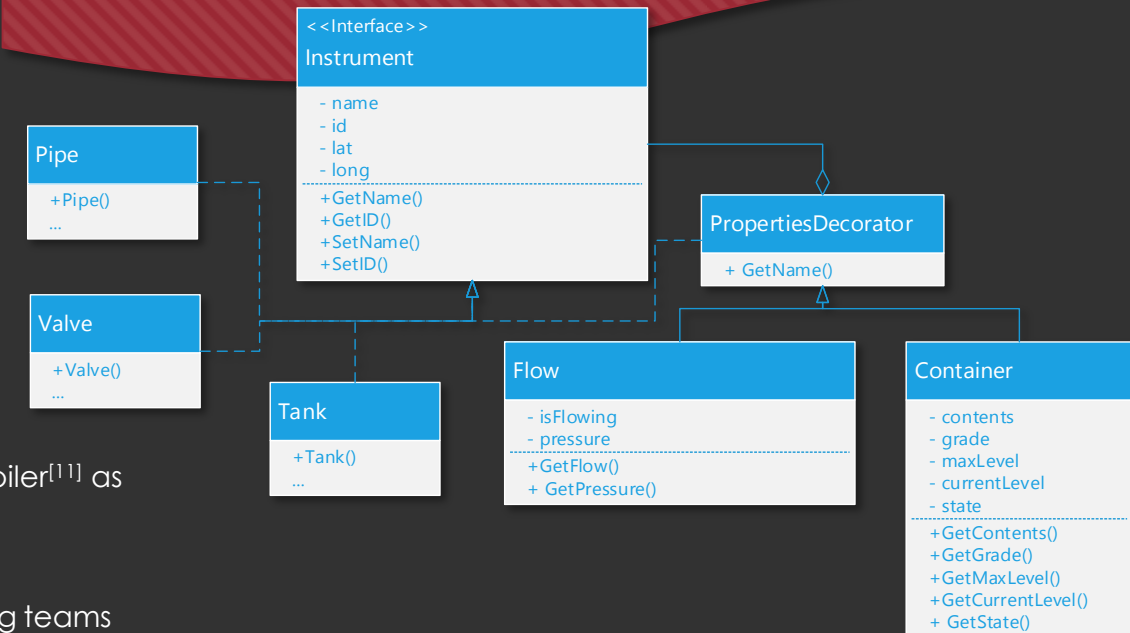


Going Native... Going Android.

- Limited HTML 5 resource and not all mobile browsers support the available resources.
 - Unable to attain bearing through `position.cord` when device is stationary^[6].
- Rich Native support, allowing full access to device sensors – especially locational sensors^{[7][8][9]}.
- Native performance 4.5x faster than JavaScript^[10], through JavaScript's use of a JIT compiler^[11] as oppose to pre-compiled code.
- The scope of this project can only support one mobile OS.
- Android has the largest market share at 79.3% (2Q13)^[12].
- SABIC – a customer of Sabisu is currently running a major project to provide manufacturing teams with Android tablets^[13]. Setting a minimal requirement for the app to run on an Android Tablet.

Let's Talk Design.

- A flowing, easy to use UI with conscious thought to touch input. Visibility in a varied weather conditions is a must^[14].
- The Application will need to make use of device local storage to allow access to cached data in the likely^[13] event WiFi/3G is not available, one major constraint to the project.
- Another consideration being made is to provide an adapter class; allowing the interaction of other systems – such as Sabisu Actions.
- The system will make use of the decorator Gang of Four pattern^[15]. This will produce greater interoperability and make the application easier for future maintenance.



Notes

Issues.

There have been no legal, social or ethical issues affecting this project. The design phase has taken a little longer than was expected due to over estimating my knowledge regarding OO principles and class interaction. However due to the analysis phase being finished earlier than expected the project is still on track.

Professional Skills.

Working in a technical field requires you to deliver concise, research driven work. Having a positive work ethic and the ability to produce reliable, consistent results will be major positives to any potential employment.

References.

- [1] Olsson, T., Ihmäki, P., Lagerstam, E., Ventä-Olkkonen, L., Väänänen-Vainio-Mattila, Kaisa. 'User Expectations for Mobile Mixed Reality Services: an Initial User Study', *ECCE '09: European Conference on Cognitive Ergonomics: Designing beyond the Product*. Helsinki, Finland, September 2009, Finland: VTT Technical Research Centre of Finland, pp. 9.
- [2] Juniper Research (2009), *Mobile Augmented Reality: Forecasts, Applications & Opportunity Appraisal 2009-2014*. Available at: http://www.juniperresearch.com/reports/mobile_augmented_reality.
- [3] Schall, G., Mendez, E., Kruijff, E., Veas, E., Junghanns, S., Reitingner, B., Schmalstieg, D. (2008) , 'Handheld Augmented Reality for underground infrastructure visualization', *Personal and Ubiquitous Computing*, 13(4), pp. 281-291.
- [4] Vartiainen, E., Boberg, P., Qvarnström, O., Brönmark, J., 'Applying Augmented Reality to Industrial Settings', *Proceedings of the 4th Augmented Human International Conference*. Stuttgart, Germany, 07 – 08 March 2013, ACM, pp. 244.
- [5] Phan, V. T., Choo, S. Y., 'Using AR for Real-Time Crosscheck of Ventilator Ducts at Worksites', *Proceedings of the 9th ACM SIGGRAPH Conference on Virtual-Reality Continuum and its Applications in Industry*. Yokohama, Japan, 16th-19th December 2009, ACM, pp.296
- [6] Popescu, A., 2012. *Geolocation API Specification*. Available at: http://dev.w3.org/geo/api/spec-source.html#position_interface. (Accessed: November 2013)
- [7] Google Inc., *android.location* (2013) Available at: <http://developer.android.com/reference/android/location/package-summary.html>. (Accessed: November 2013)
- [8] Microsoft Corporation., *System.Device.Location Namespace* (2013) Available at: [http://msdn.microsoft.com/en-us/library/windowsphone/develop/system.device.location\(v=vs.105\).aspx](http://msdn.microsoft.com/en-us/library/windowsphone/develop/system.device.location(v=vs.105).aspx). (Accessed: November 2013)
- [9] Apple Inc., *Core Location Framework Reference* (2013) Available at: https://developer.apple.com/library/ios/documentation/CoreLocation/Reference/CoreLocation_Framework/_index.html. (Accessed: November 2013)
- [10] Crawford, D., (2013) *Why Mobile Web Apps Are Slow*. Available at: <http://sealedabstract.com/rants/why-mobile-web-apps-are-slow>. (Accessed: November 2013)
- [11] Flanagan, D., 2011. *JavaScript: The Definitive Guide*, Sixth Edition. Sebastopol: O'Reilly, pp.1.
- [12] IDC, 2013., *Apple Cedes Market Share in Smartphone Operating System Market as Android Surges and Windows Phone Gains*, According to IDC . Available at: <http://www.idc.com/getdoc.jsp?containerId=prUS24257413> (Accessed 15th November 2013).
- [13] Porritt, T. (2013) Informal Meeting with Stephen Pammenter, 6th November 2013
- [14] Kerr, S., Rice, M., Teo, Y., Wan, M., Cheong, Y., Ng, J., Ng-Thamrin, L., Thura-Myo, T., Wren, D. 'Wearable Mobile Augmented Reality: Evaluating Outdoor User Experience', *Proceedings of the 10th International Conference on Virtual Reality Continuum and Its Applications in Industry*. Hong Kong, China, 11th – 12th December 2011, ACM, pp. 214.
- [15] Gamma, Erich., Helm , Richard., Johnson, Ralph., Vlissides , John. (1994) *Design Patterns: Elements of Reusable Object-Oriented Software*. Reading, Massachusetts: Addison-Wesley Professional
- †Benchmark test of the Nitro JS Engine vs. C++ Low Level Virtual Machine on iPhone 4S.