

Seminar 1- IBM – Watson Health

This seminar was given by Paddy Fagan who is the chief architecture Watson care manager development. Watson Health is a division of IBM who operate in 170 + countries and generate a revenue of \$79 billion. This software cemetery around data analytics and cognitive insights dedicated to the health domain. Due to the sector there are certain legal requirement for the development process for instance one team develops and the other ensures the finalization of the software and its customer readiness. It is important to note that the way in which Paul and his team work within Watson health may not be wholly indicative of how IBM work although some of the process will be similar. If a new developer joins the team the normal time it takes to get setup with the correct files and IDEs would be anything from 5-10 days. They require developers to use certain tools as I ensure all the developers in the team have a similar setup and the files and paths needed have been bundled together to allow easier installation when you use Eclipse as your IDE.

Software Methodology:

The software is based from an agile development model where it supports collaboration and the evolution in software development by being adaptive and flexible to rapid and radical changes in requirements. They pride themselves on the belief that software development involves many aspects like sales support and operations thinking of software and it should be a collaboration among all these different areas. Whilst the engineering aspect also should be considered in many different forms from project management, design, development, testing, pricing support and operations each one of these plays a vital role in the production of new technology /software. This creates a collaborative environment between all aspects of the software development and a central vision of how the user's software should work. They make use of sprints and operate in 2*2 week blocks the first block involves the commit and acceptance of the new code and the second centres on the release acceptance and the SRE validation stage before the process is transferred to a different team that will focus on the finalization of the code and deploy the build for customer readiness. After the acceptance stage the branch will normally be forked this allows there to be many versions on the go at a time and if there is a major issue with a branch then it can be easily overwritten by a newer branch. It makes use of Storyboards, user identifiable features, iterations of the design process and sprints. Speed is paramount in the design process and they don't appear to have a set way of coming up with the design where developers can make use of documentation wikis post its mock ups and presentations.

Use of Modelling:

The model of the system architecture is achieved by using IBM Rational Software Architect Designer. It incorporates the unified modelling language (UML) in the designing of software applications. It is a program built on eclipse, so this is another reason that the company likes to use Eclipse as its IDE. This tool allows access to cloud services and generates UML and

aids in maintaining control of the architecture. The functionality of this tool is easily extendable with plugins

Testing:

Watson Health do not use test driven development. This means that they don't require their developers to write their test cases before writing the software. However, they do require the use of JUnit as a testing suite. Functional verification tests are implemented which evaluate the logic of the feature design. It ensures that each function does what is intended. In comparison, system verification tests verify and validates the software meets the specifications of the software development process. Both types of tests are essential to the integrity of the software design however functional test would need to be passed in advance of running the system verification tests to achieve accurate results.

Refactoring:

Refactoring is done in a tiered process and it's very much a part of the company process. In general developers are encouraged to refactor as they go if deadlines of the sprint can still be easily maintained. However, if the necessary changes are extensive and it is thought that it will take a significant amount of time it is common for to leave the refactoring and ensure that it is added as a task to be completed in the next sprint. Radical refactoring only really takes place when the software has reach a point where its functionality needs to be extended because it no longer meets the requirements of the project. This type of refactoring would normally be delegated to the team by the team leader or someone in a senior technical role who has knowledge of features that may be required down the road.

Software Quality:

The company ensure the quality of the software developed by making use of architectural description during the design process. This allows for the analysis of risk during the development phase if there is some risk involved it is identified early and the risk can be accepted for declined after which alternatives can be investigated. In a nutshell this allows for the expression and understanding of the risk early on. Pair programming in the opinion of the speaker does not work all that well. So, it is not commonly done as it doesn't normally produce great result it is much more fruitful to work together where both programmers have access to a keyboard rather than taking coding in turns. Code reviews are used by Watson Health usually Paul is responsible for the code reviews of his team and where problems occur with the code he will sift through the commits to identify the individual responsible for a new code smells or bad code. SonarQube is used extensively by Watson Health it provides a continuous analysis of the code quality and offers reporting on duplicate code, how well the test cases cover the code aka code coverage, it can assist in detecting bugs and security issues and give an indication on the complexity of the code. This tool can also be integrated as a plugin with many IDEs. SonarQube is also a great tool for watermarking and has an extensive range on statistical report which can be activate if required.