# Background Research and Literature Review

* Workplace
* User profiling
* Augmented Reality
* Augmented Reality training
* Augmented Reality Navigation

# Workplace Adjustment

A workplace is defined as a place where people work, for example a factory or an office. It is where people meet on a day to day basis to perform certain tasks, or it can simply be your own home. Starting or changing workplace is not an easy task. It comes with certain challenges; such a challenge would be to be adjusted to the new job and place. There has been a study linking the fitness of a person to a job in relation to job stress. "Whilst employees can be reasonably expected to adjust to changes in jobs over time, poor job or employee job fit can result in increased stress and inefficiency in organizations". [Linking…] The study focuses on the idea, that if a person perfectly fits his job, then stress on the job is reduced and can allow the employee to easily adjust to their job. " When humans feel a loss of control this causes physiological changes which can exacerbate feelings of stress. "[Linking…] Nowadays, several companies try to allow the employee to easily adjust to their job by providing training. "Any organization that wants to succeed, and to continue to succeed, has to maintain workforce consisting of people who are willing to learn and develop continuously"[A Study…]. There are two types of training, on the job training and off the job training. On the job training is a method of imparting knowledge and training directly while on the job. Off the job training is a method of imparting knowledge and training while not on the place of work, for example through a site. The idea behind it, is to minimise stress levels and allow the employee to improve without any pressure. "Training, which aims at empowerment, development, and qualifying employees through knowledge and skills, referrers to end-oriented, organized, logical, on-going planned attempts to bring about the desired, change in the knowledge, skills, capability and attitude employees. " [A study 2].

# User Profiling

“User Profiling is the process of Extracting, Integrating and Identifying the keyword-based information to generate a structured Profile and then visualizing the knowledge out of these findings.” Through user profiling the system is capable to tailor the required information for the user to see and make use of. It is annoying for users to have to go through irrelevant documents or data to find what is specific to what they require. "User profile generation is done when we get users complete information while he registers into our system. We have identified different user attributes for profiling him into our system". User profiling has taken the form of recommender systems, where the system provides user specific recommendations in a personalized form. There are two forms of User profiling. Explicit User profiling, “In this approach users’ behaviour is predicted by analysing the user’s available data”. This is known also as static profiling, in which analysis of static and predictable user data is made. The second type is implicit User profiling, it “relies more on what we have known about user in future i.e. systems tries to learn more about the user.”. It is also referred to as Adaptive Profiling. There are three filtering techniques for user profiling, rule-based, collaborative and content based filtering techniques.

# Augmented Reality

“Augmented Reality is a variation of Virtual Environments (VE), or Virtual reality as it is more commonly known” [ARpresence]. Augmented Reality is a new form of technology that focuses on displaying realistic overlays on reality to provide extra information and content to what we see with our naked eye. It is an enhanced version of a real-world environment, through the form of media devices such pictures, videos, 3D models and sounds. “Therefore, AR can be differentiated from VR, given that the former overlays digital information in a real environment, rather than completely replacing it.” [Potential apps for virtual and augmented]. There are different categories of Augmented Reality. The first category is, marker-based AR, where the augmented overlay is only displayed once a marker is detected through a camera. It is also known as image recognition. The second category Is, markerless augmented makes use of an accelerometer, a GPS and velocity tracker to detect the location of the phone and display the AR overlay in that specific location, given its location is predefined. The third category is projection based which basically projects data in the form of light rays on objects, for example an augmented/ projected keyboard. The last category is superimposed AR, where the AR partially replaces the real view with an augmented one of that object, IKEA makes use of this application through their digital catalogues.

# Augmented Reality Navigation

Navigation systems have become necessary in nowadays world, where everything has become one search away. Continuous research is made to improve navigation systems by how they present the information to the user, without having the need to also be distracted from the primary task such as driving. The improvement of AR can help provide navigation information without distracting the user from looking away to a secondary screen or view, “For example, showing navigation markers on the windshield of the car or augmenting the video camera output of a smartphone with the navigation path”. One can display navigation information in several ways to the user, two ways how one can achieve this is either by providing arrows that point the user towards the direction they need to arrive to, or by displaying a birds eye view of the map along with the path they need to take to arrive to their destination. To providing an augmented reality navigation system there are several steps one need to take, “1. Acquire the real-world view from the user’s perspective. 2. Acquire the location information for tracking the user. 3. Generate the virtual world information based on the real-world view and the location information. 4. Register the virtual information generated with the real-world view.” One main challenge in augmented reality navigation is the process of registration. “Registration is the process of correctly aligning the virtual information with the real world in order to preserve the illusion of coexistence.” Although proper visual registrations must be met for the Augmentation to be as realistic as possible, one must not forget that the user still needs to focus on what is on his path. Added graphics and visualisations cannot block any real-world objects in view. The graphics added can be placed touching the skyline or making them translucent. “ But it is also important to note that while context speciﬁc information is useful, it should not block the the user’s view or clutter the display with excessive information.” For outdoor navigation one can use the GPS for localisation. However, for indoor navigation this can be a problem. There are several ways how to provide indoor localisation. When can make use of beams either by Bluetooth signals or WIFI signals. This will provide the user with continuous mapping, but it has also resulted to be buggy at times. The alternate option to that is by using offline waypoints. The user simply scans a marker to get a location or augment pre-programmed information within that location. "the user needs to update his/her location by scanning another way-point on the way."