A Future Roadmap through Augmented Reality Gaming Practice in IT & ITES Industries

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Abstract

This study represents a literature review of previously used gamification practices in IT and ITES industries in organizational learning and gradually evolution of those practices. The purpose of this study is two fold: 1.) to set the importance of augmented reality applications in industries 2.) to determine the future roadmap of game thinking in organizational learning introducing augmented reality process in leadership learning such as- time management, resource management, to build interpersonal relation, soft skill training etc. Prevailing leadership training theories will be applied to use augmented reality game thinking in organizational learning. Beyond that some new methodologies will be added to it. This paper is secondary data based and through library research qualitative discussion was done and tried to highlight some different approaches to use augmented reality game thinking

Keywords: Augmented reality (AR), Gamification, IT and ITES industries, Organisational Learning

1.0 Introduction

Traditional gamification practices like role play was changed gradually due to enhancement of organizational learning practices amongst employees of IT and ITES industries. After traditional one's early digitization gamification practices like badges, levels etc were set in organizational learning. Post 2015 modern gamification techniques were introduced through virtual reality (virtual role play in a virtual environment) in industries and those are currently used in organizational learning. In a newer approach, a unique employee evaluation technique can be introduced through real-time input for better employee evaluation and better goal setting for competency enhancement for the employees. To fulfill this gap a future roadmap is also determined to improve employee learning through Augmented reality gamificationapproach.

1.1 Conceptual Framework

Organizational Learning: It is the process of creating, retaining, and transferring knowledge within an organization. Organizational learning happens as a function of experience within an organization and allows the organization to stay competitive in an ever-changing environment.

When networked and computer-based learning was being developed in the 1980s, it was a forecast, that self-directed learning will become a mainstay at the workplace. And today, in the 21st century, that became true. Structured learning programs are more easily acceptable to corporate management as those are easily understandable, easily available, designed, developed and tested in workplace. Some structured learning programs face immediate obsolescence as soon as they are developed even to rapid technological evolution. Corporate knowledge has evolved to a real-time one that does not stop, but keeps changing, sometimes drastically. The millennial workforce often love to multi-task, toying with their smartphones, tablets, and desktop computers. Structured learning programs in corporate classrooms would often bore such zealous workers, and yield less desired learning output, compared to gen-x workers of yesteryears.

Unstructured learning can be adapted through social learning which is informal and real-time, senior employee's mentoring, writing on microblogs and social media networks such as Facebook or Twitter, video and audio podcasting, within the corporate networks, webinars, which may combine recorded audios, videos, presentation or YouTube which

modern workers adapt quickly and readily too. Learning should be bite-sized, entertaining and also which provides instant feedback or comment to intrigue the younger workers (Seamus Phan, 2012).

Augmented reality (AR): It is a technology that overlaps virtual objects onto the real world objects. It is a technology that superimposes a computer-generated image on a user's real world view, results a composite view. By AR technologies the information about the surrounding real world of the user becomes interactive and digitally manipulative.

Augmented reality is the technology that overlaps virtual objects on reality. AR is so much popular today because mobile devices are easier and cheaper than before. AR is used in games as well as in learning. In this studyitwill be tried to reveal the method to use augmented reality technique in organisational learning, evaluation.
AR games are played in a real world environment and a virtual layer is augmented on top of the reality. Learning is provided in a more interesting manner so that learners can acquire more knowledge from that context.

The employee who will undergo through any new training, he/she will open his/her device screen. Through camera real environment will be captured, realtime voice input from the employee will be analysed and Artificial intelligence fed object will be augmented on screen on top of the real environment.

It will be a modern approach in industries which will engage employees.

Gamification: The concept that play and work are different is a legacy of this Age where we are clocked in to work & clocked out to play (Janaki Kumar, 2015). Gamification is more than a technique,it's a mindset that has a capability to transform our workplace.

Gamification is selection of good things of game like challenges, connections, competition, feedback & adding them in a non-game context to solve a organisational problem. It is a tool to motivate people, to change their behaviour through a positive reinforcement.

In traditional approach of gamification, role play in given certain circumstances was very useful to enhance leadership and management competency of employees. Later, on early 2010 main gamification practices were leader board, points, badges or levels. These can be identified as early digitization gamification practices. Post 2015, virtual role play through avatar in a game format has been stared in use. In a case we can just imagine, to find out a hidden treasure, several clues are provided and based on the clues how the assesses perform and make decision, based on that, data points are identified and in backend certain characteristics are judged which is based on certain models.

Augmented Reality Gamification Approach: Through augmented reality technique game industries are revolutionised. So this AR game context is implemented in industries also in a non gaming context. Several benefits can be achieved by this process.

A real time input is analysed for better evaluation in this approach. In Augmented reality always through device real world is captured and on top of that objects are augmented. Moreover in some training trainee's voice is also captured on real time and based on the data points are found out from the recording, trainee's competency is judged and future training schedule is also suggested.

As trainee's voice is recorded so more data points are identified as a result better evaluation can be performed by this system.

AR and Virtual reality blend the physical and also the digital world through video and audio. Both technologies have the same idea of immersing users into a digital environment. But while VR takes the user to a complete virtual world which isolates the user from reality, AR put virtual objects over the real world. It uses smartphones and algorithm that uses sensors, markers to detect the position of physical objects those are being captured through device camera and then decides the location where to augment simulated objects.In the world of augmented reality user can look around through artificial objects in the front layer.In short, VR replaces real world and AR adds to real world (Julia Matyunina,2017).

Regarding IT and ITES industries-
The Information Technology (IT) and Information Technology enabled Services (ITES) sectors go hand-in-hand in every aspect. This industry is most emerging industry in the world. So employee engagement in these sectors is very important and keep the employees motivated during work hours is also very important area of research. So in this research we have tried to fulfil this attempt to a new approach.

In this research we tried to enhance the quality of employee learning by this new augmented reality approach. Where It is possible for the employees to interact with both the virtual world and the real world, avoiding the social isolation. Moreover much accuracy is acquired by this technique as employee's voice, action everything is being captured during learning. Anyway this new interesting method will definitely enhance the curiosity of the millennial employees.

2.0 Review of Literature :

In 2017 Jingya Li, Eric De, LoeFeijs, fengwang, Jun hu in their study 'Augmented reality game for learning' found six key notes. Amongst those four are relevant to the present study. First, as younger students spends much time at home and their parents also will be able to know about their learning status, it is effective to design AR learning games that students can play at home than classroom, outdoor etc. Social interaction effects were also found by playing AR learning games.Second, like previous studies this study also gave similar result that AR learning games are fun, interesting and enjoyable.Third, social interaction effects were found by playing AR learning games that affected the learning achievement or motivation in turn.Fourth, they found various game elements and AR features, those were used in the design of the AR learning games. Location based, image based, 3D model, face to face, physical model, AR presentation input etc are the common and frequently used features incorporated in AR learning games. Certain game elements are also used like goal, quiz based, time limitation, role play, solve puzzles, board game, feedback etc.The study also came up with five recommendation for the design of AR learning games like involve learners in design process, clear learning objectives, identity effects of AR features, encourage social interaction, study game mechanics.
This study is performed on students, eventually same research can be performed for employees who are learner also in the organisation. In that context the present study can be proceeded further.

Armstrong, Landers, Collmus in 2016 in their study 'gamifying recruitment, selection, training, performance management' found that in the field of training, game-thinking has been applied to improve overall training effectiveness, to enhance motivation during training and also to increase training completion rate. Based on Landers and Callan's (2012) technology-enhanced training effectiveness model (TETEM), it can be inferred that a well-designed serious game can still fail to produce desired training outcomes if trainees are not properly motivated to engage with that game.
By determining which elements of games are most closely tied to learning, those elements can be extracted for application without taking the burden of a complete serious game design process.

Landers, Bauer, Callan, and Armstrong (2015) comprehensively reviewed psychological theories of motivation to identify which theories were most promising to describe the effects of gamifying training motivation. In doing so, they identified five major theoretical motivational frameworks that might apply: the theory of gamified learning (Landers, 2014; Landers & Landers, 2014), Skinner's (1948) classic learning theories, Vroom's (1964) expectancy theory, Locke's (1968) goal-setting theory, and Deci, Ryan's (1985;2000) self-determination theory.

Armstrong, Landers, Collmus in 2016 also highlighted that future research on gamification of training effectiveness might continue through popular training effectiveness models (e.g., Kirkpatrick, 1976), but can also consider models that consider the impact of technology explicitly (e.g., TETEM, Landers & Callan, 2012; Landers & Armstrong, 2014).

2.1 Summery of Literature Survey:

These studies show that gamification and also AR learning are new emerging areas of research. It can be said that the following factors may exhibit or inhibit the said functioning.Several factors are identified in this study such as- unique method of recognition, different survey process, leadership training etc. So to proceed further and to discover new ways to modify several HR components (organisational Learning, recognition process, survey method) we have set a new goal to perform this researchwith these new techniques.

2.2 Objectives of Study:

1. To make this gamification practice more interactive & real time a new practice Augmented reality game concept can be utilized. The aim for this research paper is to highlight how the augmented reality gamification practices can be implemented in organizational learning and training purpose.

2. The structured and unstructured learning can be combined. As the AR platform will be predefined and designed and the augmented object will be Artificial Intelligence fed it can be declared as structured learning. Moreover as live interaction and live involvement, instant reaction is required of the trainee it can be identified as unstructured learning also. As this a new approach, this study propose to fulfil the gap between structured and unstructured learning.

3. In Augmented reality always through device real world is captured and on top of that several things are augmented. Moreover in some training trainee's voice is also captured on real time and based on the data points are found out from the recording, trainee's competency is judged and future training schedule is also suggested.As trainee's voice is recorded so the present study will highlight how better evaluation could be performed by the system here more data points are being identified.

3.0 Methodology

Types of Research: Library research

Design: This is a case study based research. To proceed for the proposed research area, we need to assume certain cases under every sector where we need to incorporate AR based gamification technique.

Data: Qualitative secondary data are considered here.

Procedures:To begin the study, we need to understand the context how this technique will be implemented. Based on the understating of the situational context, suggestions are given for it's applications and final recommendation.

4.0 Analysis and Interpretation:

Proposed areas where AR gamification practices can be implemented:

4.1.1 During Recognition (awards):

Recognition and awards are the most powerful weapon to motivate an employee. So a new technique to appraise an employee is always welcome to organisation.

A situation can be created where every day-end manager will be evaluating every employee's performance in his team. The winner of best performer of that day will be kept secret to the manager only and that manager has to map an award to that particular employee's cabin wall.

Next day every employee will be directed to scan their office cabin wall with their own device (obviously that device will be installed with augmented reality app) and only the winner will be able to find an award has been augmented in his/her office cabin wall through their device screen.

This interesting approach of awarding employees will be very unique and definitely it will enhance employee's motivation, engagement.

4.1.2 During survey/Feedback:

To improve a quality of service/ product survey is the most important thing which is unavoidable. Presently surveys are made either online or through offline forms. These surveys are having certain limitations. Those are structured on the basis of predefined set of attributes and those attributes in the form of options are presented to the person who is undertaking the survey. To mention something beyond those predefined attributes and also to save time of filling those offline forms or online surveys and also to make boring surveys to interesting ones, this unique method can be adopted.

When the employee has some time he/she can open augmented reality app through which device's camera will start and it will start capturing the real environment. A case can be described, the person who is on his office break time if he/she wants to take that survey at that time, on the tea table also an artificial intelligence fed character can be augmented in his/her screen.

The survey can be from administration department, finance department, HR department etc. Any artificial intelligence fed character will be augmented in the person's device screen representing any department and that character will ask question to that person one by one.

As the person only needs to speak and express his/ her idea regarding that department it will be much easier for him/ her also to provide feedback though in an interesting manner also in short time.

As the employee's voice will be recorded and those recorded voice will be analysed in backend so, much more data points will be identified. As a result more accurate decisions anbe revealed through the survey.

Most positive thing the person will not be aloof from the real world also as through camera real environment will always be captured.

4.2 In leadership training:

During promotion managerial training occurs which includes soft skills section, such as how to motivate employees, while others may be technical in nature.

During this kind of training a simulated situation can be presented so that the trainee's (the employee who is undergoing through the training)voice input will be recorded and trainee will be conversing with an augmented associate who is fed with Artificial Intelligence. Based on the voice input by the trainee he/ she will be judged, his/her performance is analysed in backend, data points are identified and simultaneously according to his/her performance future training suggestion for enhancement of competency will be given by the system.

4.2.1 Resource management/ Interpersonal training:

Interpersonal training can be defined as a process that empowers team to enhance quality of decision making, problem solving, and team-development skills to achieve business results. This type of training can include motivating team, making workplace more enjoyable, enhancing team productivity, collaboration with team member.

Team training can be administered either in-house or externally. Through the use of technology, team training no longer requires people to even be in the same room or to be present physically at all. It can be transformed through AR. A specific case can be described to set a interpersonal training. A trainee who is undergoing through a managerial training, for example he/ she can be treated as a manager and a junior employee(with AI feed) will be augmented in trainee's device's screen on trainee's next chair or on office desktop which is being captured through trainee's camera. Suppose the augmented junior is unwilling to work for extended shift with no onsite opportunity also in night shift. How the trainee motives the augmented junior for that particular role it is recorded through voice recorder. This recorded voice will be analysed, data points will be identified and based on that, training score will be uploaded and further training session will be advised.

4.2.2 Time management:

With good time management skills we are in control of time deadline and stress and also able to make progress at work and maintain a good work/life balance.To develop good time management skill first thing to understand the situations are beyond our control and what are in our control. According to that proper plan should be designed.

A specific case can be described to set this time management training. A trainee who is undergoing through a time management training, for example he/ she can be treated as an employee and a senior manager (with AI feed) will be augmented in trainee's device's screen on the trainee's next chair or on official desktop which is being captured through trainee's camera. Through conversation the augmented manager will make understand to the employee regarding importance of time, describing a specific project deadline is appearing, some gnattchart, calendar will be also augmented in the trainee's device screen. During this discussion trainee's voice will be recorded and recorded voice will be analysed, data points will be identified and based on that, training score will be uploaded and further training session will be advised.

4.2.3 Intrapersonal training:

Intrapersonal means communicating with one's self, conversation that is continually going on in our own mind (Ashraf AL Singlawi, 2014). This helps to get a good picture about our strengths and weaknesses and thus helps to improve our personality.

Any intrapersonal training can be designed also in the same fashion. A case can be described like that any intrapersonal time management training can be designed through one good- inner self and another evil- inner self characters augmented in office table performing question, answer which will provide a lesson so that beyond work pressure also employees should finish projects on time.

Through any conversation of two characters any new launched company policy will be introduced or any training can be provided also.

4.2.4 Soft skill training:

Soft skill implies personality traits, social graces, communication and personal habits those are mandatory to build relationships with other people. How to answer the phone calls with client or how to be friendly and welcoming to customers, ethics training, how to motivate others- these are also included in this type of training section.
Soft skills training can be administered either in-house or externally.

A case can be designed like the way of augmenting two characters on screen describing a situation of importance of soft skill training and they need to provide good lesson by action and conversation also to enhance any employee's skill.
After that exercises can be created where the user interacts with an AI fed augmented employee. Eventually that trainee will be evaluated and will be given by scores. This can be a new approach to build soft skill among employees.

5.0 Discussion - Benefits of AR based learning

4.1 A new hype can be created among employees which will lead to more interest in learning and enhance learning efficiency and fun experience.
4.2 Knowledge transfer through AR will engage employees in knowledge acquisition and motivational outcome.
4.3 In virtual reality only predefined set of attributes are mentioned to judge an employee. In this method employee's live voice, action will be captured. So much more data points are revealed.

5.0 Conclusion and Recommendation for further research:

Wherever you go there you can learn and after evaluation of learning you will receive instant feedback. This is the key for gamification technique and for this reason only gamification is so much popular today.
If proper research can be done on design of this technique a new era can be revealed in organisational learning due to AR's uniqueness. Further research to be performed to add some more new ideas to improve this AR research and to overcome the hurdles of this research.
Gamification design research faces a big problem as most research outcomes are not adopted by practitioners in organisation as those are impractical (Rogers, 2004). So in a structured manner designing should be done for this research.
Several models of gamified learning should be tested and revised in order to best measure the effects of AR based game-thinking on training motivation.

Acknowledgement

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