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# Future of Game Development and Simulation

**Devendra Lingayat[1], Shubham Mokashi[2], Ranjeetsingh Gill [3], Prof. Shilpa Kuchekar[4]**

Department of Computer Science and Engineering, PCET'S Nutan College of Engineering and Research, Lonere, India[1234]

**ABSTRACT**: This project is concerned with describing this method, how we employ it in various task and how we learn to analyses, design, develop and focus on the method that engages and aspires for innovation in digital entertainment and games.
A major design challenge is to balance the freedom of an open world with the structure of a dynamic experience. The whole development process revolves around creating physics which is observed in the real world by using game stimulation and testing it numerous times
This would also help in tourism industry which is also called real world simulation.Simulation is genre of games that are designed to mimic activities you'd see in the real world. Simulation and tourism would make together a deadly combination which would provide future gaming and modeling industry a great boom.

**KEYWORDS:** Gamming, Game, Simulation, Future, Advantages

## I. INTRODUCTION

A game played by electronically manipulating images produced by a computer program on a television screen or other display.
It requires a combination of aesthetic and technical execution. Graphic designers interpret the game's concept; game play experts design the player scenarios including technical specifications & game physics.
Simulation is goal-directed experimentation with dynamic models, i.e., models with time-dependent behaviour.
As such, simulation adds other dimensions to experimentation in simulation, it is possible to perform experiments even when the real system does not exist or not conveniently accessible for experimentation.
In simulation, one can explore effects of a variety of experimental conditions that may not be practical to perform in real-world experimentations, e.g., an earthquake simulation or a simulated crash in a flight simulator. These two possibilities are definite superiorities over experimentation with real systems.
Did you know that people who play FPS games have better reflexes and are more aware of their surrounding? Or that gamers who love playing racing games are more observant when driving a car in real life?
As it turns out, the brain doesn't make the difference between real-life and simulation as long as you are focused on the task. To our neuronal network, it doesn't matter if you're dribbling a ball on the field or if you're playing soccer games on a PC – the same areas will be activated in the brain! True, you won't develop the necessary muscle and resistance to be able to play the game professionally, but you will already have the basic skills and orientation required on a soccer field.
Even more, it was proven that pilots who use video games to train (besides the standard training) outperform their colleagues who don't.

## II. RELATED WORK

From 2004 to 2021 10,242 games where made, approximately 600 new games are made every year.
The console segment ranked second with $49.2 billion U.S dollars and PC ranked last with an estimated $35.9 billion U.S dollars in 2020
In the simulation prefecture Microsoft Flight Simulator is a series of amateur flight simulator programs for Microsoft windows operation systems and earlier for MS-DOS and Classic Mac OS. It's one of the longest running best known, and most comprehensive home flight simulator programs on the market. It is stillbest-knownsimulator till date
In the upcoming technology driven futuristic world the gaming and simulating will play a key in one country's economy. Which would also help a country progress ahead towards future.

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## III. THEORY

A simulation is a model that mimics the operation of an existing or proposed system, providing evidence for decision-making by being able to test different scenarios or process changes. This can be coupled with virtual reality technologies for a more immersive experience.
Simulations can be used to tune up performance, optimise a process, improve safety, testing theories, training staff and even for entertainment in video games! Scientifically modelling systems allows a user to gain an insight into the effects of different conditions and courses of action.
Simulation can also be used when the real system is inaccessible or too dangerous to assess or when a system is still in the design or theory stages.
Key to any simulation is the information that is used to build the simulation model and protocols for the verification and validation of models are still being researched and refined, particularly with regard to computer simulation.

**How Simulation Works**
Simulation works through the use of intuitive simulation software to create a visual mock-up of a process. This visual simulation should include details of timings, rules, resources and constraints, to accurately reflect the real-world process.
This can be applied to a range of scenarios, for example, you can model a supermarket and the likely behaviours of customers as they move around the shop as it becomes busier. This can inform decisions including staffing requirements, shop floor layout, and supply chain needs.
Another example would be a manufacturing environment where different parts of the line can be simulated to assess how their processes interact with those of others. This can provide an overview of how the entire system will perform in order to devise innovative methods to improve performance.

There are a range of advantages to be gained through the use of simulation, including:
1. Less Financial Risk
Simulation is less expensive than real life experimentation. The potential costs of testing theories of real-world systems can include those associated with changing to an untested process, hiring staff or even buying new equipment. Simulation allows you to test theories and avoid costly mistakes in real life.

2. Exact Repeated Testing
A simulation allows you to test different theories and innovations time after time against the exact same circumstances. This means you can thoroughly test and compare different ideas without deviation.

3. Examine Long-Term Impacts
A simulation can be created to let you see into the future by accurately modelling the impact of years of use in just a few seconds. This lets you see both short and long-term impacts so you can confidently make informed investment decisions now that can provide benefits years into the future.

4. Gain Insights for Process Improvement
The benefits of simulation are not only realised at the end of a project. Improvements can be integrated throughout an entire process by testing different theories.

5. Assess Random Events
A simulation can also be used to assess random events such as an unexpected staff absence or supply chain issues.

6. Test Non-Standard Distributions
A simulation can take account of changing and non-standard distributions, rather than having to repeat only set parameters. For example, when simulating a supermarket, you can input different types of customers who will move through the shop at different speeds. A young businesswoman who is picking up a sandwich will move through the shop differently from an old couple or a mother doing a weekly shop with two children in tow. By taking such changing parameters into account, a simulation can more accurately mimic the real world.

7. Encourages In-Depth Thinking
Even the process of designing a simulation and determining the different parameters can offer solutions. By thinking in-depth about a process or procedure it is possible to come up with solutions or innovations without even using the final simulation.

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8. Improve Stakeholder Buy-In
A visual simulation can also help improve buy-in from partners, associates and stakeholders. You can visually demonstrate the results of any process changes and how they were achieved, improving engagement with interested parties or even enabling a simulation-based sales pitch.

## Limitations

While there are a great many advantages to using simulation, there are still some limitations when compared to other similar techniques and technologies, such as digital twin.
A digital twin expands on simulation to incorporate real time feedback and a flow of information between the virtual simulation and a real life asset or assets. The difference being that while a simulation is theoretical, a digital twin is actual.
Due to this, simulations have limitations when it comes to assessing actual real-world situations as they occur.

**Why is Simulation Used?**

Simulation is used to evaluate the effect of process changes, new procedures and capital investment in equipment. Engineers can use simulation to assess the performance of an existing system or predict the performance of a planned system, comparing alternative solutions and designs.
Simulation is used as an alternative to testing theories and changes in the real world, which can be costly. Simulation can measure factors including system cycle times, throughput under different loads, resource utilisation, bottlenecks and choke points, storage needs, staffing requirements, effectiveness of scheduling and control systems.

**What can be Simulated?**

Any system or process that has a flow of events can be simulated. As a general rule, if you can draw a flowchart of the process, you can simulate it. However, simulation is most effective when applied to processes or equipment that change over time, have variable factors or random inputs. For example, our supermarket from earlier has variable and random factors due to customer use times, requirements and stocks.
Using simulation to model complex and changeable dynamic systems can offer insights that are difficult to gain using other methods.
While simulation can be used to manage processes, procedures and assets, Swedish philosopher Nick Bostrom took the notion of simulation further in his 2003 paper, 'Are You Living in a Computer Simulation?' He argues that by adding artificial consciousness to simulations, you can blur the lines between reality and simulation, making it difficult to tell if you are living in reality or
If you are living in a simulation. This simulation hypothesis argues that, should you become aware that your 'reality' was not actually 'real,' your memories could be edited by the simulation to once again make you blissfully unaware that you are not actually a real person in the real world!
Moving away from the realms of post-human simulation, let's return to some 'real world' types of simulation…

## Types of Simulation

Simulation can be broken down into three overarching types, as follows:
1. Discrete Event Simulation
Modelling a system as it progresses through time, for example;

- factory operations (stamping, turning, milling)
- traffic analysis (roads, networks, queues)

2. Dynamic Simulation
Modelling a system as it progresses through space, for example;

- machine kinematics
- human ergonomics
- aerodynamic testing
- virtual prototyping

3. Process Simulation
Modelling physical interactions between two or more systems, for example;

- in-service product modelling
- in-manufacture product modelling
- weather forecasting

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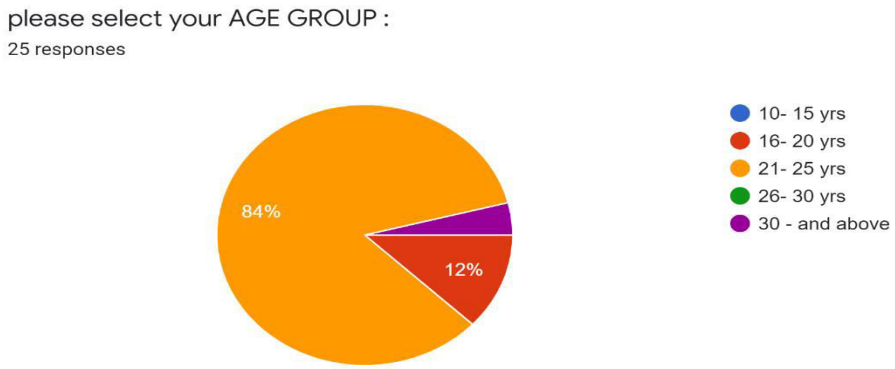
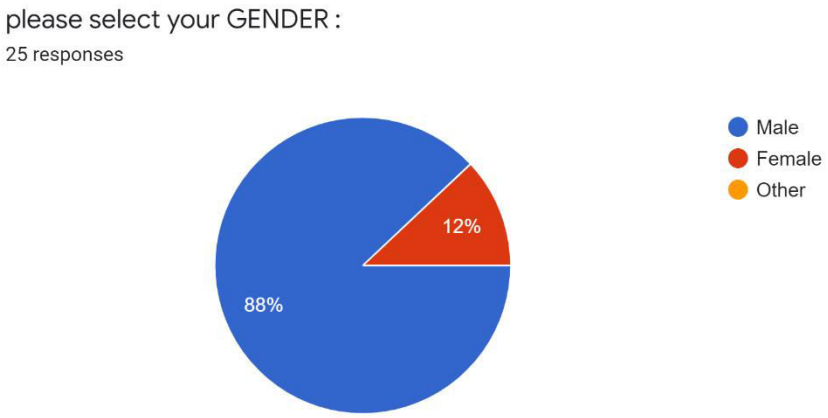
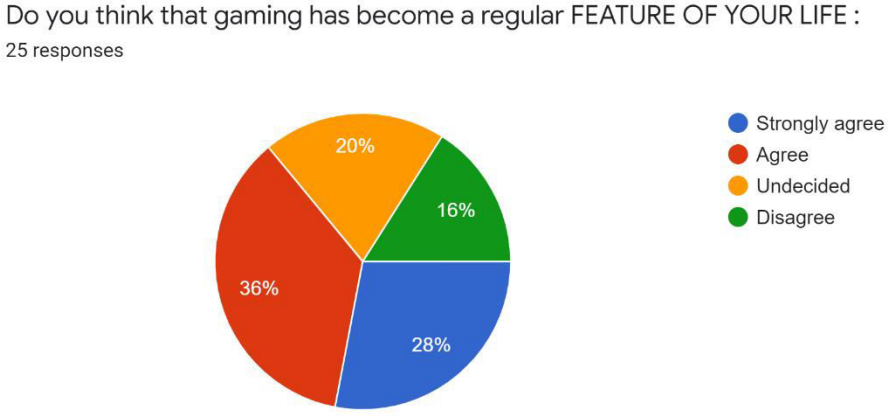
## IV. SURVEY CONDUCTED IN OUR COLLEGE




The above data illustrates that the majority of people are from the age group 21-25 years approximately 84 % which indicates that are the young adults. The second largest chunk of pie chart is occupied by teenagers of age group 16-20 years about 12%. The age group of 30 years and above age occupies the smallest portion the pie chart around 4%.




Here, the data correctly illustrates that this community of currently dominated by male having the massive no of 88%. Leaving a small chunk of 12% for females which we will see increasing in the coming years



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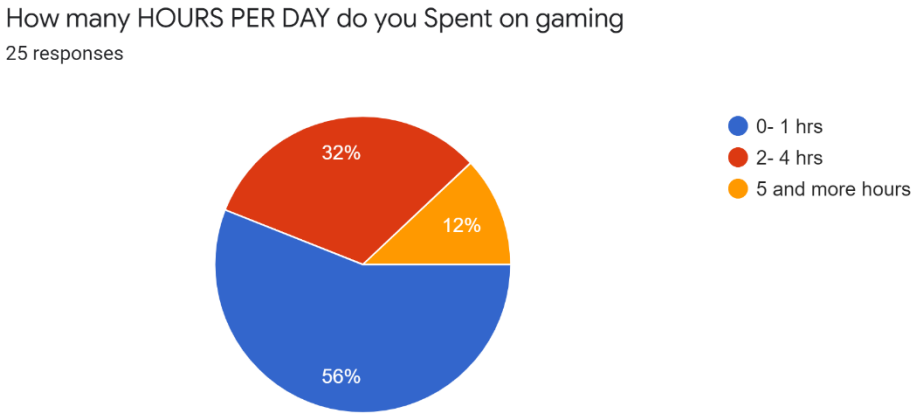
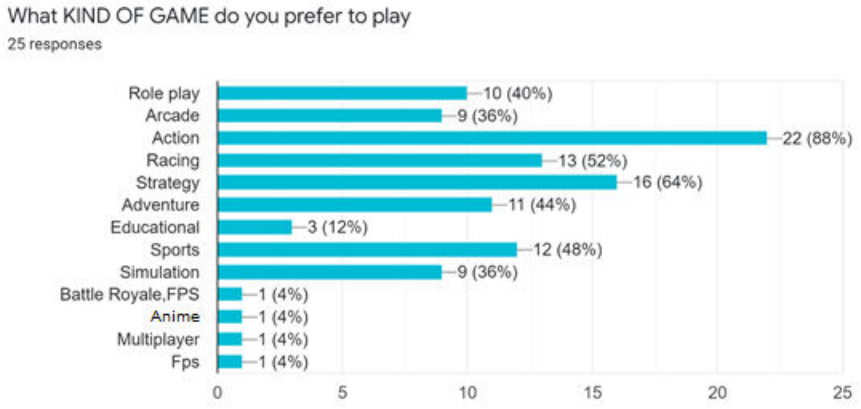
Most individuals agree that gaming has become a regular feature of your life, while 16% people disagree that it is not as that important. In addition 28% strongly agree to this notion.




It is clearly observed people mostly play games around 1 hour on a daily basis. However, around 32% people play games over 2 hours on a regularly. The remaining individuals play 5 or more hours daily they can be called as heavy gamers.




The bar chart illustrates the percentage of people who prefer different genre of games. Majorly liked genre is action where the prime gaming examples would be Call of duty and BGMI. The second most played genre is strategy which is the most competitive kind of game. Then comes racing, adventure and Sports which are like by sports enthusiasts.

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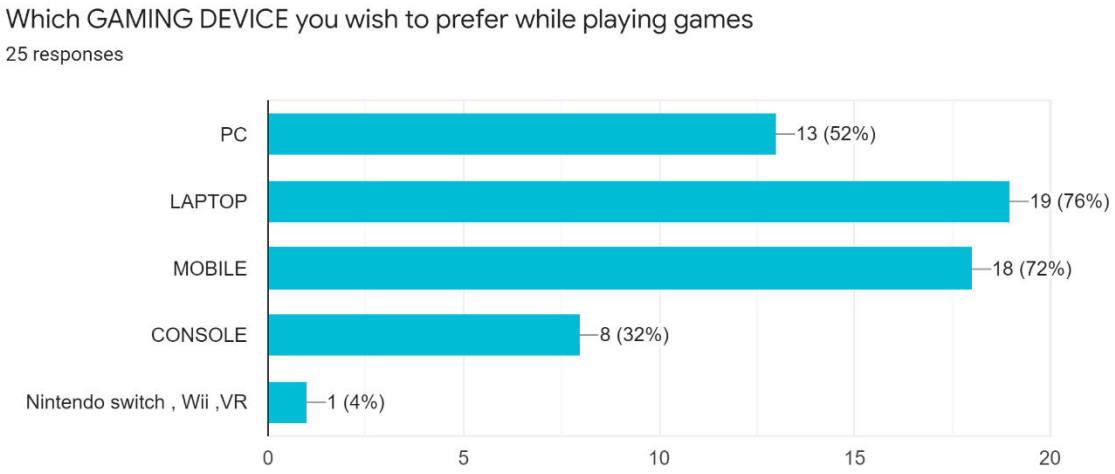
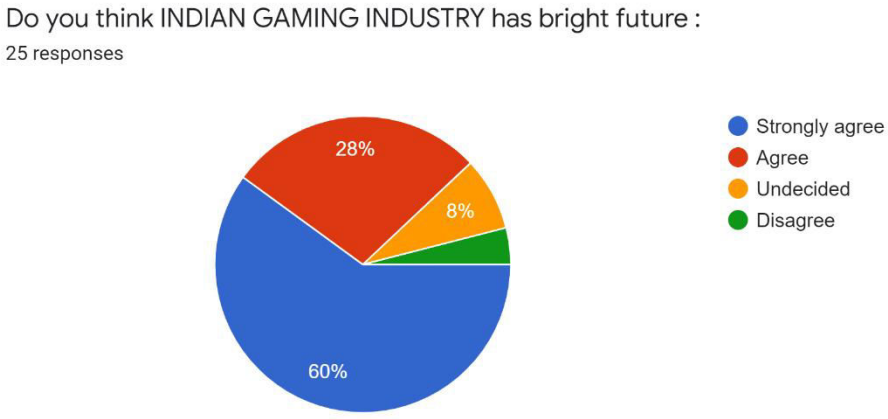



Most of the individuals prefer mobile and laptops respectively as they are handy to use rather the PC where mobiles and laptop are head to. Then PC gamers comes in place with the third grossing place which provides high performance compared to laptops but are expensive compared to them. The rest prefer console over the other equipment.




Around 60% people believe that gaming Indian gaming industry has a bright future while minor percentage of people disagree. Approximately 25 % of people agree. If we see the percentage of people agreeing is around 88% which is clearly a positive sign.

## Applications in Real World

There are many examples of simulation across industry, entertainment, education, and more. Here are a few notable examples:

Automotive

Simulation allows the characteristics of a real vehicle to be replicated in a virtual environment, so that the driver feels as if they are sitting in a real car. Different scenarios can be mimicked so that the driver has a fully immersive experience. These type of simulators can help train both new and experienced drivers, offering a route to teach driving skills that can reduce maintenance and fuel costs and ensure the safety of the drivers themselves.

Biomechanics

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Simulation can be applied to biomechanics to create models of human or animal anatomical structures in order to study their function and design medical treatments and devices. Biomechanics simulation can also be used to study sports performance, simulate surgical procedures, and assess joint loads. An additional example is neuromechanical simulation that unites neural network simulation with biomechanics to test hypotheses in a virtual environment.

City and Urban Planning
Simulation can be used to design new cities and urban environments as well as to test how existing urban areas can evolve as a result of policy decisions. This includes city infrastructure and traffic flow among other potential models.

Digital Lifecycle Design
Simulations can assist with product design, allowing digital prototyping and testing to create better performing products with a shorter time-to-market, while also assessing the lifecycle of the finished product.

Disaster Preparation
Simulations can replicate emergency situations, to help with disaster preparedness.This includes training and designing responses to events such as natural disasters, pandemics or terrorist attacks. Responses can be tracked and assessed through the simulation, highlighting potential problems and areas where more training may be required for responders, as well as ensuring any mistakes are made in a safe environment ahead of any real life event.

Economics and Finance
Economics, macroeconomics and finance also benefit from simulations. A mathematical model of the economy can, for example, be tested using historical data as a proxy for the actual economy. This can be used to assess inflation, unemployment, balance of trade and budgets.Elsewhere, simulations can replicate the stock exchange or be used to test financial models. Banks also use simulations to replicate payment and securities settlement systems.

Engineering Systems
Simulation is widely used for engineering systems to imitate operations and functions of equipment, processes and procedures. Engineering simulations can combine mathematical models and computer-assisted simulation for design or improvement of existing processes.

Ergonomics
Simulation can be used to analyse virtual products and working environments incorporating an anthropometric virtual representation of the human, also known as a mannequin or Digital Human Model (DHM). These DHMs can mimic the performance and capabilities of humans in simulated environments. This type of simulation has applications ranging from assembly lines to disaster management and video gaming to waste collection.

Flight Simulation
Flight simulators have been used for years to train new pilots in a safe environment. This not only allows pilots to be assessed safely, but can also test instrument failures and other problems without risking the pilot, the instructor or the aircraft. You can also easily repeat the exact same scenarios, such as approaching a runway to land, under different conditions, not to mention saving fuel and other costs compared to actual flying time.

Marine Craft Simulation
Much like flight simulation, it is also possible to simulate working in a ship or submarine. Simulators can include those that mimic the bridge, engine rooms, cargo handling bays, communications or remotely operated vehicles. These are used in training institutions, colleges and navies.

Military Applications
Sometimes referred to as ‘war games,’ military simulations can be used to test out military plans in a virtual environment using computer models. These can also incorporate social and political factors and are used by governments and military organisations around the world.

Network Systems
Simulations have been applied to network and distributed systems to test new algorithms and protocols before they are implemented in live systems. These can be applied to applications including content delivery networks, smart cities and the Internet of Things.

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Project Management
Simulation can be used for project management analysis and training purposes. Whether training managers or analysing the outcomes of different decisions, simulation is frequently conducted with software tools.

Robotics
Robotics simulations are used to mimic situations that may not be possible to recreate and test in real life due to time, cost or other factors. The results of these tests can then be assessed and transferred to real life robots.
Production Systems
Production systems can be simulated using methods such as discrete event simulation to assess manufacturing processes, assembly times, machine set-up, and more.

Sales
Sales can be simulated to examine the flow of transactions and customer orders as well as costs, labour times and more.

Satellites and Space
The Kennedy Space Centre used simulation to train space shuttle engineers for launch operations. This would see people interact with a simulated shuttle and ground support equipment. Simulation is also used for satellite navigation tests.

Sport
Statistics are widely used as part of sport simulation to predict the outcome of events and the performance of individual sportspeople. Sports simulation can also be used to predict the outcome of games and events as well as for fantasy sports leagues. Biomechanics models can also be used to assist training, assess fatigue levels and their effect on performance and more.

Weather
Weather forecasting uses simulations based on past data to predict extreme weather conditions such as hurricanes or cyclones.
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## V. FUTURE SCOPE

We live in a world where VR and AR are a thing, yet, we still learn from dusty books and explore boring topics in school. Sure, the math does help with your analytical thinking and memorization trains the brain to retain information, but this is not all we should be doing in school!Video games have steadily risen in popularity for years. And with people looking for new ways to socialize and stay entertained during the pandemic, the trend has only accelerated. Gaming is now a bigger industry than movies and sports combined.
The question arises here is , what could be the future ? As the people say could this gaming community sustain or live up to its mark?
So, what can we expect from the world's most exciting media in the coming years? Researchers believe that mixed reality will be the big winner, with future games "combining virtual and augmented reality technology", expanding on the proven popularity, technology and obvious accessibility of games such as *Pokémon Go*.

## VI. CONCLUSION

This paper explores the idea of using simulation games, with entertainment content, for learning/teaching discrete-event simulations. It is argued that while we can use realistic examples, even within a game format as in business decision making, games provide an entry point for non-experts especially for middle/high school students. Two games were proposed: Dystopian City and Medieval Wars. Dystopian City focuses on learning the use of different types of decision blocks. Medieval Wars focuses on the use of batch, separator, and decision blocks. Both games require knowledge of basic discrete-event simulation components like arrivals, processes, and resources to mention a few. In addition, it is encouraged on both games to further introduce new simulation components so the game can grow with the needs and skill levels of the gamers

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