Future of Gaming held by AI

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1. Abstract:

Most Parts Of Video Games – They Feature Racing Car Games, Shooters, Or Strategy Games – All Have Different Components Powered By AI Or Related Applications. For Example, Enemy Bots Or NPCs (Non-Programmable Characters).

Providing a Realistic background and In Addition better resolution or better quality of the visuals are the main factors that are provided by the AI. In Gaming, It Also Helps To Increase Player Interest And Satisfaction Over The Long Term. There Are Different Ways AI And Game Development Are Growing Through Each Other.

Despite The Fact That AI Is Accustomed To Bringing Life To Video Games, Computer Games Are Currently Being Designed With The Aim Of Studying Their Own Patterns To Improve Their Algorithms, Which In Many Ways AI Is Finding Is One Of Further Developed.

2. Problem Statement:

AI Runs A Repository Of Information Accessible To It And Uses This Data To Create An Existence Where Characters Can Survive And Perform Basic Actions. All The Necessary Information Is Collected Through AI And Designed To Create A Play Environment, Including The Situations, Objectives, And Actions Of The Characters Of The Game, Which Become More Realistic And Natural. To Demonstrate This, The AI Algorithm Must Be Rewarded With Data To Produce The Best Possible Responses To Specific Stimuli.

So, there are mainly three types of problems in the gaming industry,

1) Making The Games more and more Realistic and Smarter

2) Transforming the skills of Developers and Players

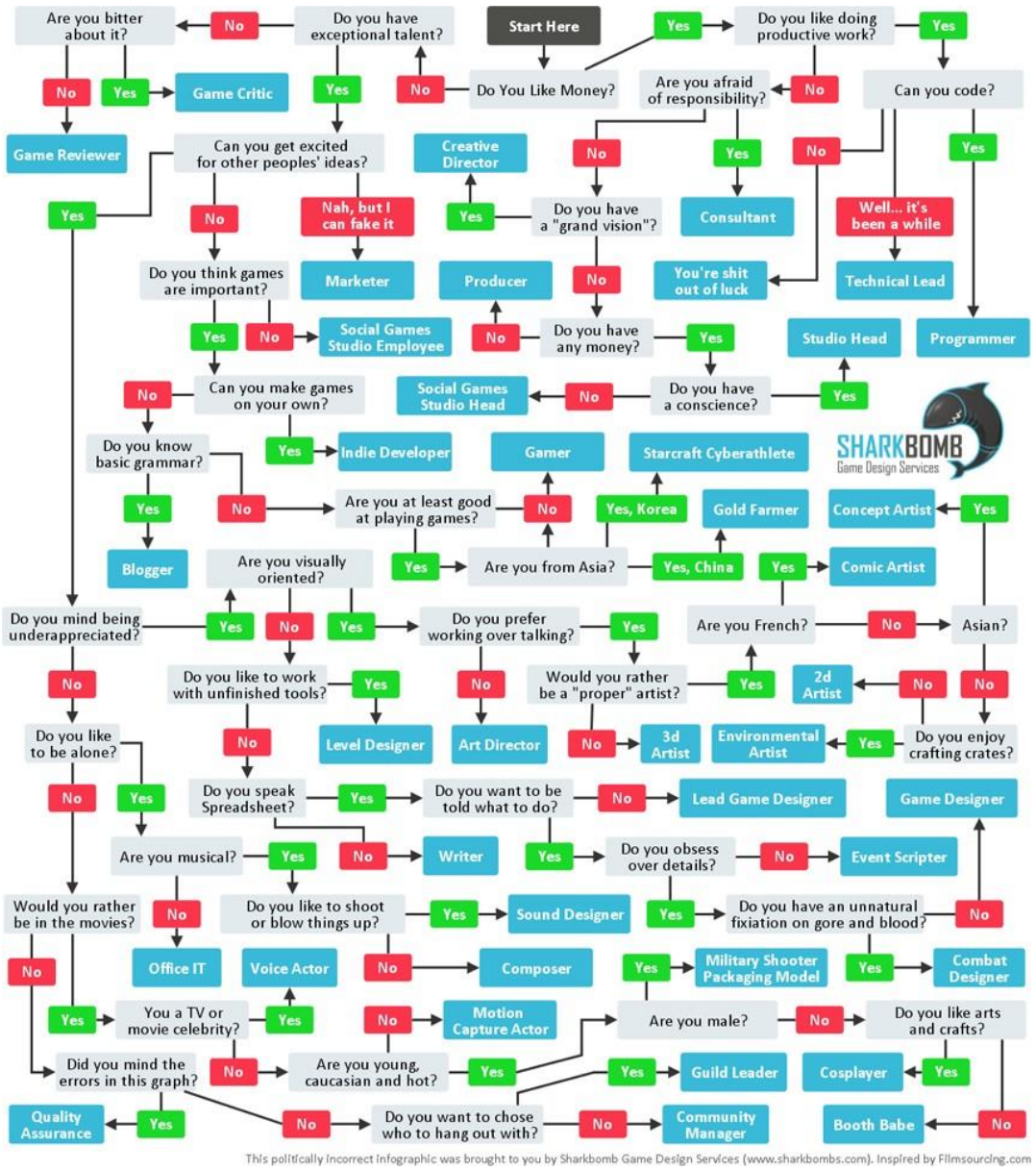
3) The Upgradation of Mobile Games Industry.

Basically , Enhancing the Overall UI and Game Experience in PC, Mobile etc industries.

3. <u>Market/Customer/Business Need Assessment:</u>

Most of the people, those are graduating from a well-known college or from good colleges are heading the technical placement entry or the higher studies. The mere 6-7% of all of the student graduates takes whole part in the gaming industry. Even in that the whole solely 80-90% of the students will take part as a programmer or developer in this industry but the chances of the working in this industry is more than just vast.

Here a little demonstration of what does working in gaming industry really means:



The students those are opting themselves in a technical background misses the best opportunities that are bound to in gaming industry. This article, I am trying to establish the opportunity in this article.

4. Target Specifications:

4.1 Doing market segmentation:

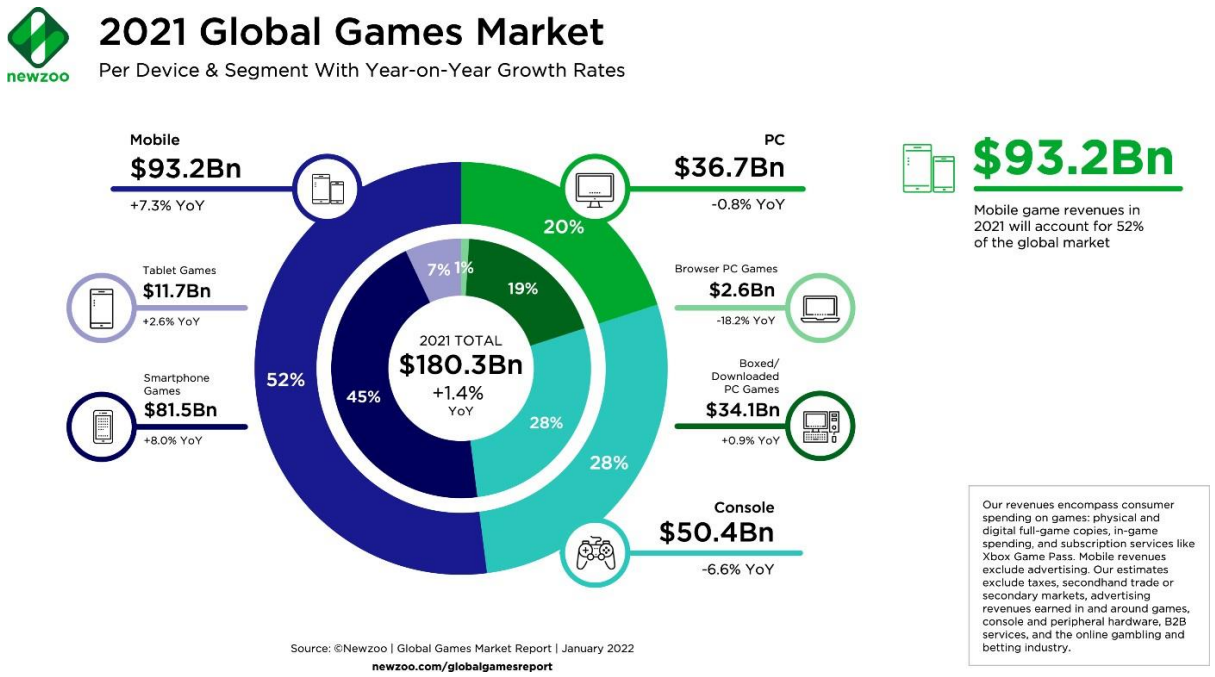
There are mainly 4 types of segmentation that generally distributes the gaming market:

1) Demographic: Identify the key information like age and gender.

2) Behavioural: Track the customer experience and determine the reach of them to your site.

3) Psychographic: Examine the shared values, beliefs and opinions about the audience.

4) Geographic: Find the differences between traffic and metrics from different areas of world.



4.2 To build and examine the website metrics:

Once the target audience is being segmented, the next step that is to add the website metrics into the mix. Understand characteristics of the model, sharing the interests and engaging metrics online are the fundamentals of building the target metrics.

The next things after the website metrics are:

1) Discover the best-performing marketing channels – Which channels bring the most gamers to your site? Are paid ads more effective than your referral strategy? Answer these questions by researching for the most effective marketing channels.

2) Benchmark engagement metrics – Investigate how much time players spend on competing sites or the industry as a whole compared to yourself. How many games do they play on average during a visit? Do they access the site via mobile or desktop?

3) Track audience loyalty and overlap – How loyal are your users? If they often frequent various other gaming sites, they may be looking for something that you're not offering. Put yourself into your users' shoes and find out.

4) Add geography into the mix – Specific games may be more popular in certain geographic regions than others. Collect and correlate the data to segment your audience by geography and optimize your marketing efforts.

5. External Searches:

5.1 The importance of AI in the gaming industry:

AI in gaming is not all about creating all-knowing bots that will challenge the player to good levels. Indeed, this is the priority set for the industry for implementing the AI but the real approach is about creating more responsive, adaptive and challenging games. Just look at Cortana in Halo (yes, Microsoft named its virtual assistant after this character, and we're so here for it!). And that's not the only game about artificial intelligence. Several other games (like Detroit: Becoming Human) revolve primarily around AI and androids.

5.2 What more AI have in its pockets:

With AI, games are able to provide a better experience to their gamers. Creating life-like situational developments to progress in the games adds excitement to the gameplay. Increasing complexity in games with AI ensures gamers are hooked to the game. There are quite experiences of AI like,

1) NPC: NPCs are where Game AI is mostly used. These are characters in the game who act intelligently as if they were controlled by human players. These characters' behaviour is determined by artificial intelligence algorithms and engines.

2) Pathfinding Algos: Pathfinding algorithms are mainly used in maze types games which allows to find paths, also to build maps used in games.

3) Decision Making Algos: AI will let the decisions that you make have a bigger impact on the gameplay. For example, in Red Dead Redemption 2, the behaviour of NPCs and their interaction with you depend on variables like blood stains on your clothes or the type of hat that you are wearing. Since there is an enormous matrix of possibilities, the whole game world could be manipulated by your decisions.

4) Data mining: Artificial intelligence allows game designers and studios to perform data mining on player behaviour to help them get an understanding of how people end up playing the game. This allows the game developers to learn more about his/her and others gameplay in detail.

5) Anti-Cheating System: The most common type of cheating used by NPCs is when the NPCs make use of information that is not available to the players in that situation. As an example, in a combat game, an NPC might be given human-like senses like seeing and hearing, but they might just cheat by checking the player's position on the game engine. To avoid this scenario, there are implementation of Anti-Cheating System is important.

5.3 What is the future that AI has hold for this Industry:

1) Cloud Based Gaming with AI: This option streams the games online rather than downloading and installing it separately.

2) Blockchain based Gaming: It's not quite known method but such games are the most profitable among all methods (e.g., ev.io, .io based games)

3) Audio or Voice-Recognition based games: using voice recognition algorithms we can build games based on instruments and karaoke

4) VR or wearable support games: Using ARVR and AI, developing games supporting contact games are now quite generation.

5.4 Most asked question, Can AI make games?

Yep, it can. AI has played a huge role in developing video games and tuning them to the preferences of the players. The most commonly used technique for this is machine learning. Basically, you could have the AI system learn from a lot of games, create approximate representations of the games, and then proceed to recombine the knowledge from these representations and use conceptual expansion to create new games.

AI has been bringing some major changes to the world of gaming, and its role is growing at a rapid pace. It wouldn't be surprising to see Artificial Intelligence in gaming being used even more in the near future, seeing how it helps create more challenging and engaging game experiences.

6. Benchmarking alternate products:

The online gaming industry is constantly evolving. New technology makes last year's model obsolete overnight, a game can have explosive popularity for a month and then plummet out of nowhere, and there's always an update to make whatever you're playing better. In such a competitive industry, continuous improvement is the key to smart decision-making and success. Benchmarking data can provide you with the analysis and insights you need to solve your pain points, whatever they may be.

There are 7 benchmarks to win the Digital Gaming Industry.

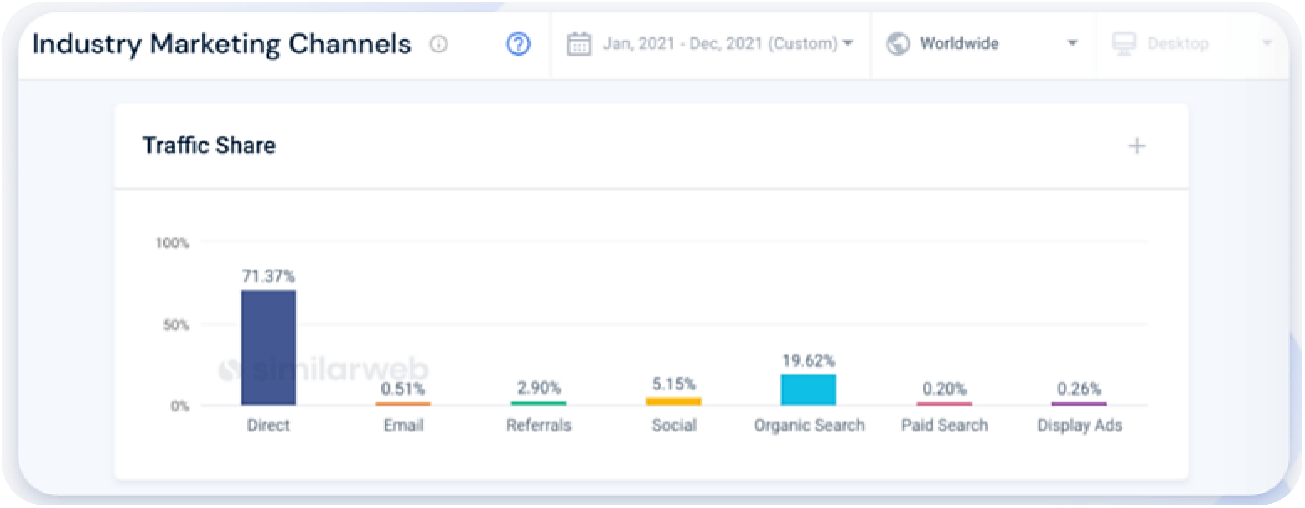
1) Total Visits: It's one of the basic website metrics that determines the stand of the company in the market. After reading YOY analysis, top 100 websites had 76.6 billion which is almost 20% increase from 2020's survey.

2) Top Websites: Twitch is most popular online game streaming platform, which earns 6-7% global traffic share in 2022 for the industry(almost 1.2 billion monthly visits). The YouTube is the second most viewed and streamed platform which shares 4-5% of the global traffic in industry.

3) Website Stickiness: A sticky website means that your users are choosing to return to your site time and time again, and usually implies loyal users and strong customer satisfaction. Website stickiness is calculated by dividing the average number of unique visitors by the average total monthly visits.

4) Desktop vs Mobile web split: For the most industries, the rapid growth that has been seen is in mobile gaming than PC gaming. But the market is rules by PC and console games. From last year analysis, there is growth of 1.2% in the mobile gaming than PC and console gaming.

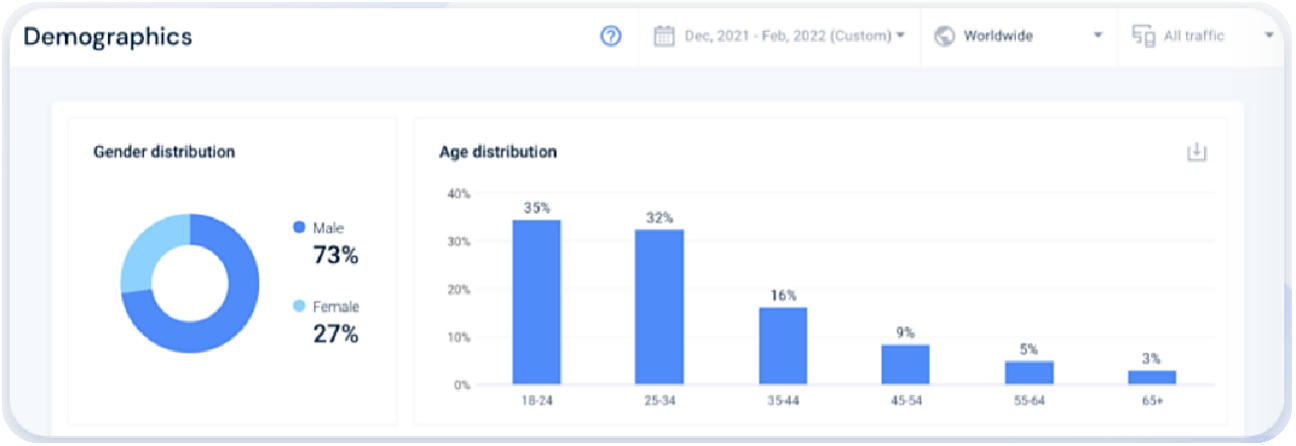
5) Marketing Channels: The most responsible factor in the market of any industry is the Media. Benchmarking these channels against your competitors' performance will help you plan and implement changes accordingly to get the most ROI from your marketing budget. For instance, if you see that most of your competitors have a weak referral marketing strategy, you can capitalize on this weakness in their business performance and work with top affiliates to draw traffic towards your site.



6) User experience and satisfaction: The user metrics which is used to measure onsite experience and satisfaction. Those 3 are, Avg. session duration, Avg. pages per visit, Avg. Bounce rate.

7) Audience Analysis: Who are the people actually coming to your website? How do the gamers on your site differ from those of your competitors? What gives you that competitive advantage? These are questions that audience analysis can help you answer. Defining your ideal customer and target audience is fundamental for any business venture, product launch, and digital strategy. With the right data collection, you'll be able to expand user reach, grow into new markets,

and ultimately win consumers away from your competitors. Males are more than twice as likely to visit online gaming websites compared to females. And age distribution for this industry tends to skew younger, with 67% falling between 18–34 years old.



These Benchmarking Techniques are thoroughly understood and implemented by some of the best companies in this industry, some of them are:

Activision, Electronics Arts(EA sports), Ubisoft, Gameloft, Tencent, Unreal Engine.

Tencent, Ubisoft, and Electronic Arts are the leaders in the mobile gaming space. The organic growth strategies carried out by these three companies outnumbered the others. All three companies aim at establishing a better connection with their consumers through an open and connected ecosystem. Also, they have a refined market and positioning strategy in place. In terms of the inorganic growth strategies, Ubisoft and Electronic Arts are the trend-setters

Activision Blizzard and Take-Two Interactive are the challengers in the mobile gaming segment. Activision Blizzard has a commendable brand image, global presence in the market, and a well-defined marketing and sales strategies working in its favour. It, however, falls behind in terms of the number of yearly mobile game launches. In the year 2018, it announced only two major mobile games, Diablo Immortal and Call of Duty: Legends of War (WARZONE).

7. Applicable Regulations:

1) Patents regulated by the government on the restrictions and usage of online gaming for kids and adults.

2) Laws passed by the Supreme court on online games like poker, violating games etc.

3) Protection/Ownership regulations for patent companies.

4) Creation of Anti-cheating AI system for the fraud and cheat detection.

5) Ensuring open-source, academic and research community for an audit of Algorithms. Also, providing the new ideas for community.

6) Review of existing work authority regulations.

8. Applicable Constraints

1) Social constraints

2) Time constraints

3) Financial constraints

4) Physical constraints

5) Psychological constraints

6) Performance constraints

9. Business Opportunity

1) With the benchmarking report, one can be well versed about the leaders, challengers, innovators, and niche players

2) Be informed about the prospective competitors gaining edge and progressing rapidly

3) Understand the customer preferences towards different competitors and their products

4) Apprehend the kind of brand image that the mobile gaming companies have in the market

5) Which competitors are approaching expansion and product development, and where does the priority lie

6) How different companies are emphasizing on the R&D and innovation

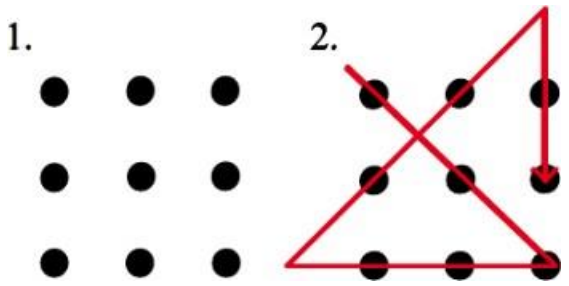
7) Companies can fine-tune business efforts and form new market strategies based on the evaluation

8) The benchmark can also act as the early indicator of which companies are best suited for investments, prospecting, and strategic alliance

9) The companies were chosen based on a plethora of parameters, such as financial strengths, intensity in their business activities in the market, the innovations that they are invested on, the mergers and acquisitions that they made in the recent years, amongst others.

10. Concept Generation:

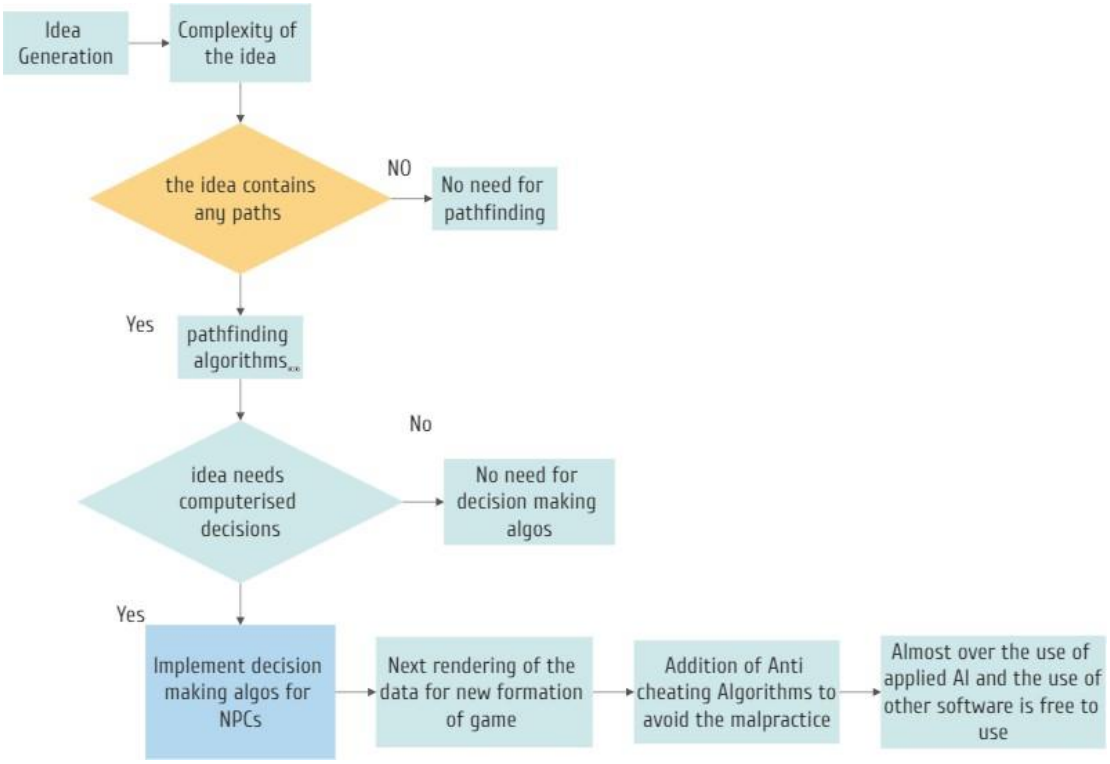
The game industry is seeking ways and means to enhance and develop its creative processes. One way to ensure creative output in the form of successful products is to gather versatile and talented teams or provide a supportive and inspiring atmosphere conducive to creativity. For the team leaders, the task of getting the most out of the staff can be difficult. It is always a matter of allowing enough freedom but within constraints, or managing order and chaos simultaneously.



For this, simple puzzle the 2. Is the solution which could be generated if we knew the constraints and reliable paths from which we can solve any given problem. As in this, all the 9 dots must be get connected by 4 lines only. And that's how we get soln.

As mentioned earlier, in addition to our game-based techniques, we can design and examine several game-specific idea generation tools in the GameSpace project, including computer programs, pen and paper approaches, game specific brainstorming, toy-boxes, user enquiries, and mobile applications. In contrast to general idea generation techniques, we aimed to support the specific domain of idea generation: casual mobile multiplayer games.

11. Final Product Prototype:



12. Product Details:

At initial stage, the idea of the project must be implemented on paper and pen. The first stage of any type of game design is the simplified architecture are structures of the games also called to be simple blueprints of the game.

Pathfinding algorithms:

There are some games where the priority is set to be finding the correct path in order to win or explore the world in the respective game. So, the pathfinding algorithms comes handy in those situations such as Dijkstra or true random in Tetris or in

minesweeper but in high end games where the pathfinding leads to exploring, heuristic function algorithms like A* used in warcraft series.

NPCs and decision making:

Now NPCs are the most common and important part in development of any game. The development of a NPC can be done by implementation of AI.

Anti-cheating System:

Now the main issue of the online gaming sector is the cheating malpractice. The Most of players uses MOD consoled games or some hacking tools that provides an user to control the game its own way, which is quite troublesome if we thought for a bit.

So, I am planning to implement the anti-cheating system using AI and ML where the data mining and malpractice detection can be done by some ML algorithms such as kernel SVMs, HMM classifiers. With the help of such algorithms, we can track the positions and scan the overall data to find the roots of malpractice in the game.

Such an example can be seen in CS: GO, which is a fighting type game. where players tend to fight with their opponents with provided weapons.

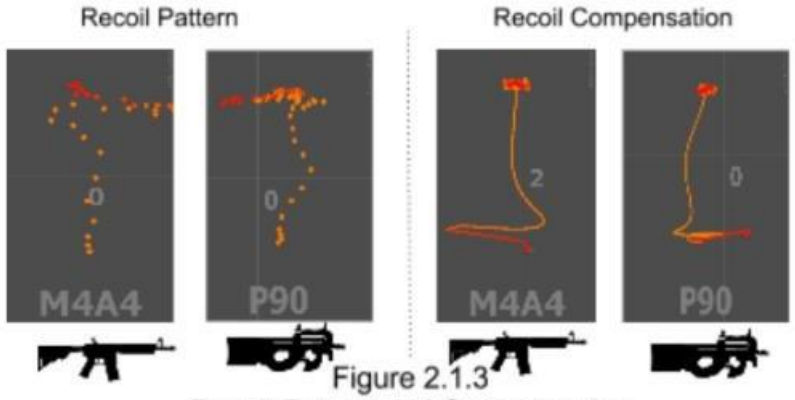
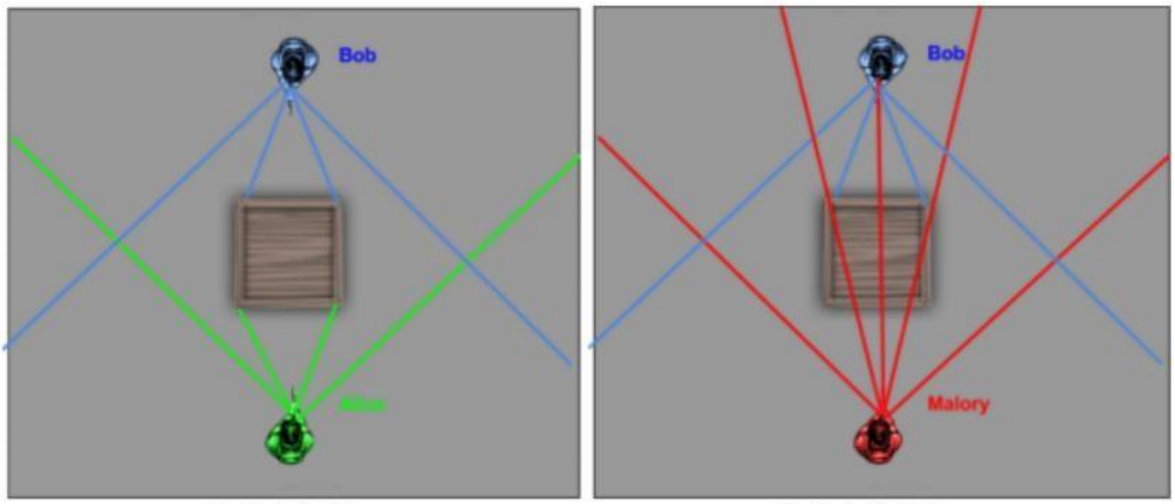


Figure 2.1.3
Recoil Pattern and Compensation

Here we can track the recoil pattern of the guns and can predict the verdict about the cheating.



A: Bob & Alice **B:** Bob & Malory

Figure 2.2:
Fair Clients and Cheating Clients

Same as here the Bob and Alice are the players, playing the game in good manner, but Malory is definitely cheating as we can track the position of Malory, even she can shoot the bob despite having a box in front of her.

Which types of cheats could someone can use:

1) Wallhack: where one can penetrate through walls, and handle the game.

2) Aimbot: where one can aim to other player despite having obstructions in between them.

3) Triggerbot: where a program that can shoot, if there is a player sensed. Even if there is no player to be seen.

4) No Recoil: programmed in such a way to have complete control over the weapon, so no bad structure of weapon could make you lose.

13. Conclusion:

Developers Have Started Creating AI-Based Player Profiles In Their Game Structure To Give Players A Characteristic Vibe.AI Players Are Prepared And Trained In Player Behaviour Styles To Create A Realistic Feel In The Game Gone Are The Days When Sports Were Just About Passing Time.

Nowadays, New AI Technology And Algorithms Are Evolving, Giving Game Developers An Exciting Opportunity To Show Their Full Potential.

The Implementation of the Anti-cheating system for basic level of gaming sector could bring a big change in the gaming industry. Where the count of rational players can say to be ideal data for the revenue and prediction for the new generation to get learn.

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