



AR Technology



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What is AR ?

Augmenting

- identifying
- contextualizing
- rendering

Sensing

- camera
- geo-location
- orientation
- digital compass

Augmented reality (AR) is an enhanced version of the real physical world that is achieved through the use of digital visual elements, sound, or other sensory stimuli delivered via technology.

Presenting

- HUDs
- See-through display
- Mobile displays



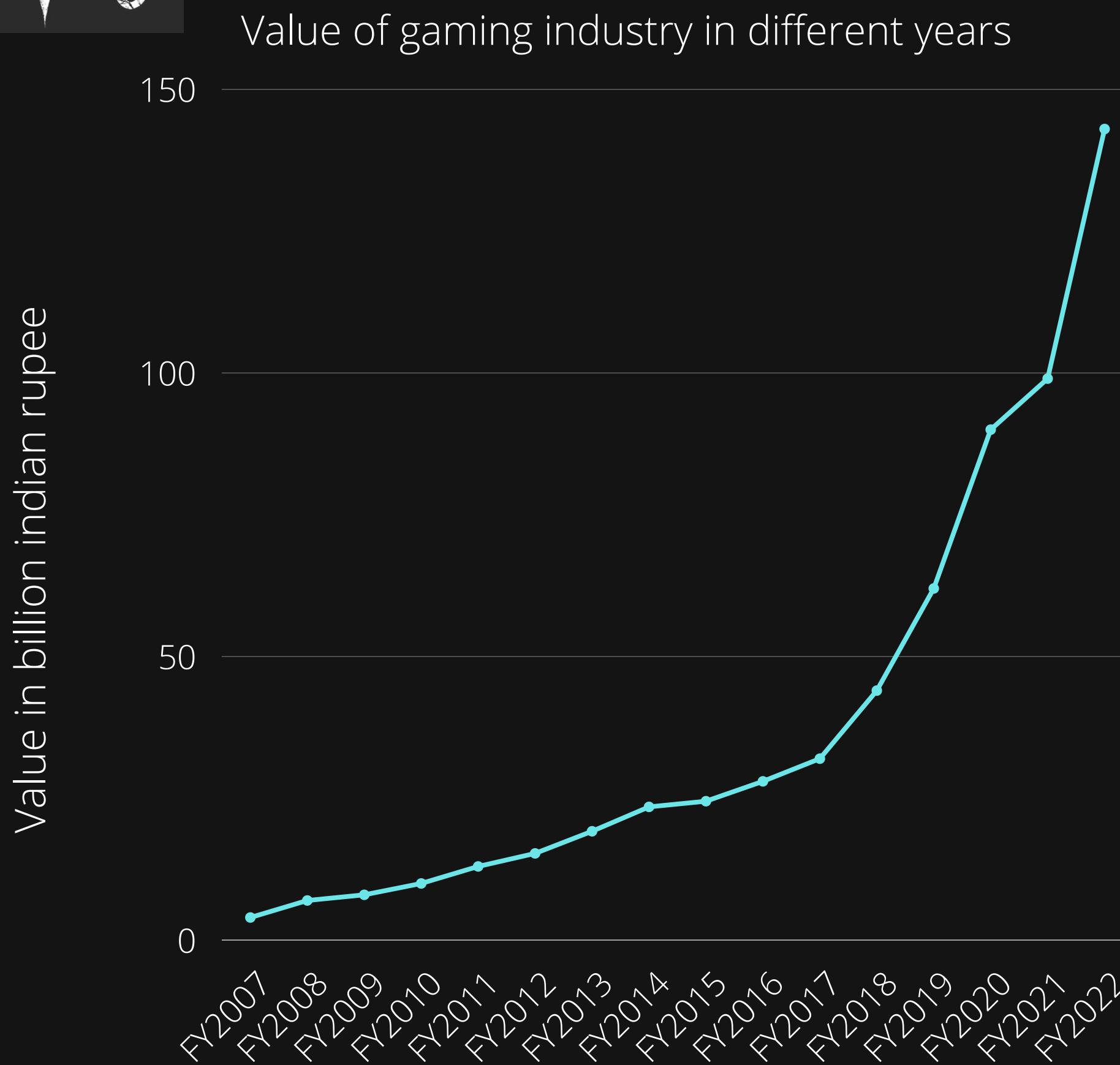
Market Research And Industry Analysis

The key industries that are already taking advantage of AR :

- Retail : Indeed, there are brands which have already developed an AR app that buyers can use in stores
- Business Logistics : With AR presenting a unique opportunity to reduce costs and increase efficiency, optimize transportation, route optimization and warehousing, logistics are already being changed by AR tech power
- Entertainment : AR is proving to be quite the marketing opportunity because it allows entertainment companies to take the experience a step further, letting consumers dive deep into a highly-interactive product
- Education : Students can now attend a class using AR apps which allow them to feel like they're being part of the classroom ambiance. The use of AR in education is bound to allow more people to access specific lessons and modules, even if they live 100 miles from school

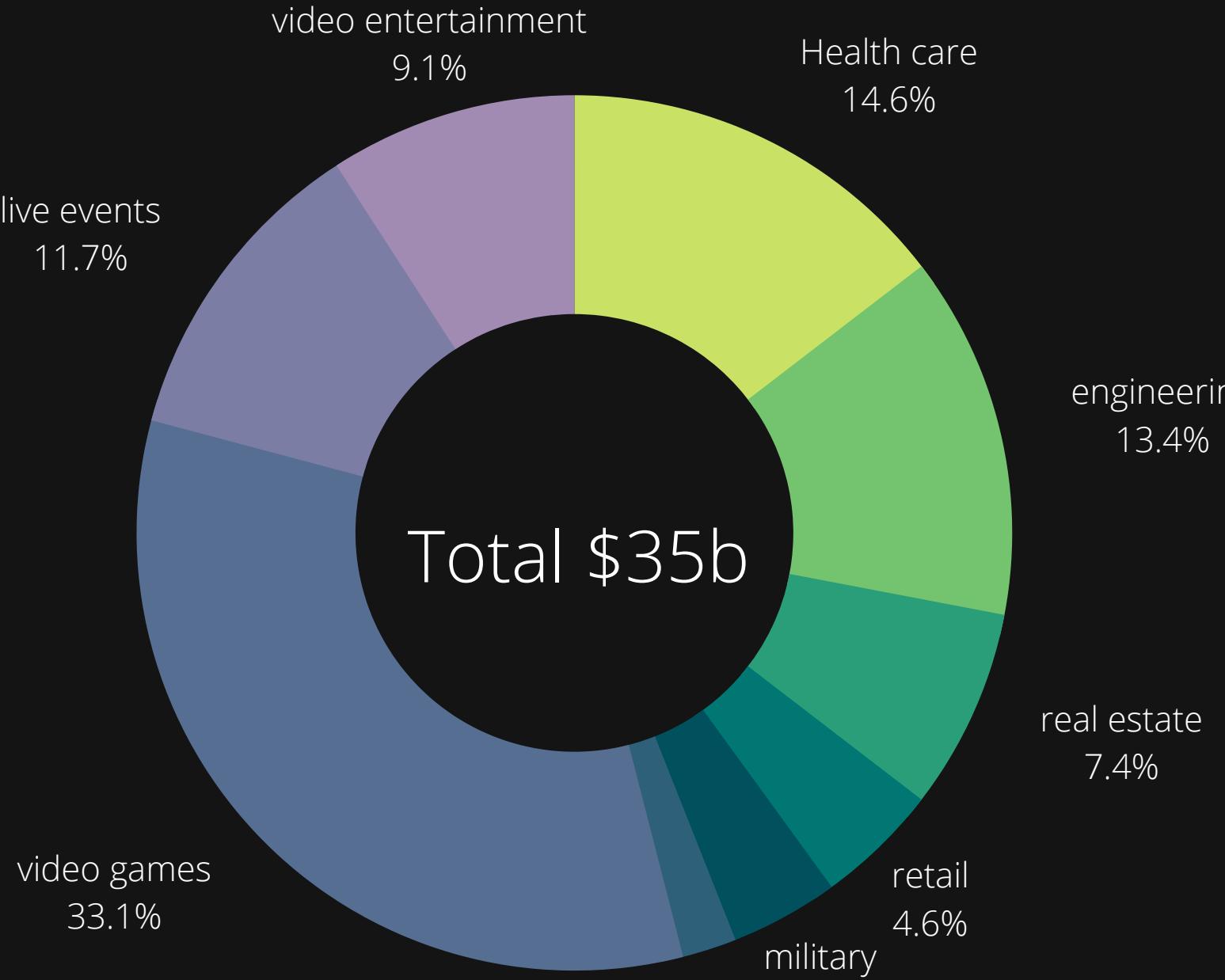


Market Research And Industrial Analysis



The Global Augmented Reality Market size is expected to reach \$89 billion by 2026, rising at a market growth of 46.3% CAGR during the forecast period.

The global augmented reality gaming market reached a value of US\$ 6.39 Billion in 2021. Looking forward, IMARC Group expects the market to reach US\$ 38.03 Billion by 2027, exhibiting at a CAGR of 33.8% during 2022-2027.



The Diverse Potential of AR and VR Application

Adoption of AR technology

70%

Americans who are unsure of what it is.

60%

Americans who have access to AR via Facebook, Snapchat

46%

Americans who have used AR app without being aware of it.

37%

World population with access to AR via Facebook, Snapchat

31%

Americans who don't know what AR is.

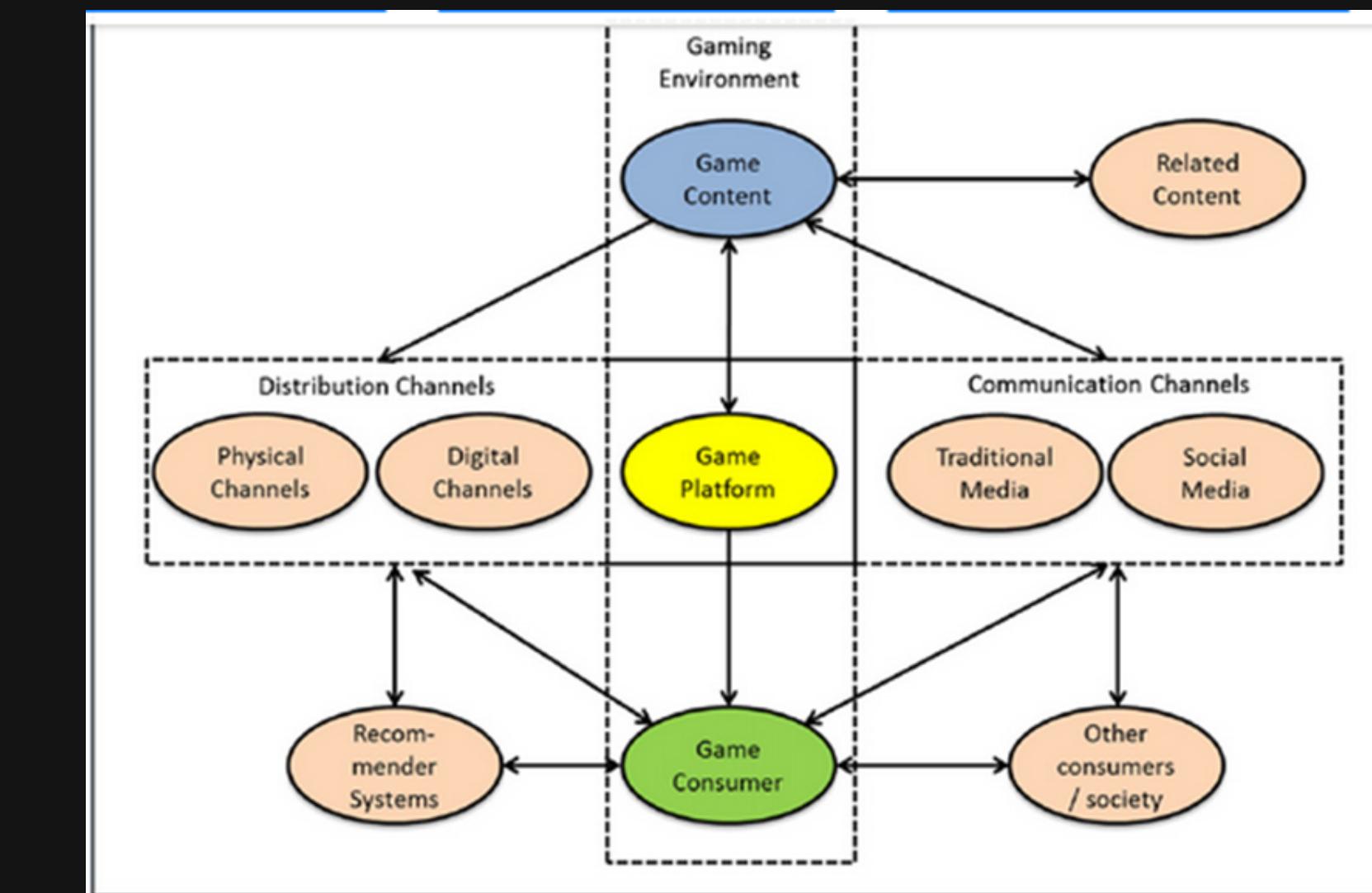


Fig. 1. Conceptual framework.

Sources: IBTimes, GearBrain, Inceptionxr, BRP Co

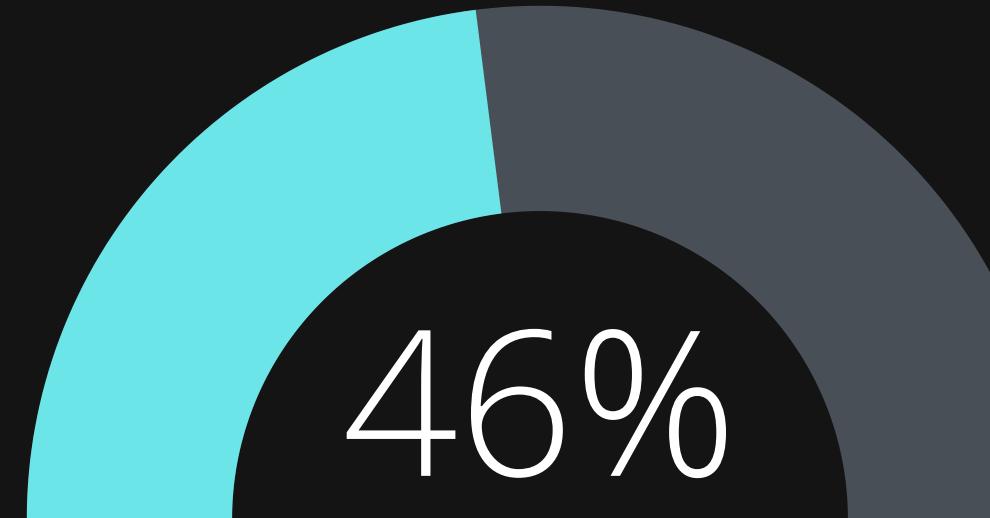
Ways Augmented Reality Will Influence UX/UI

1. Design Becomes More User-Friendly : One of the most important aspects of being a successful UX/UI designer is being able to actually promote the creation of a user-friendly product
2. The Crucial Feedback : Learning from user's invaluable feedback to be able to continue improving the user experience. With AR, designers will have the chance to get feedback faster than ever before .This real-time feedback will actually help users get specific live results based on previous actions, whereas before they would have to get data that was static.
3. The Notion of Space : Before AR, experts knew that all visual content existed in 2D. With AR, this will change. Whereas before all language was immediately codified into 2D UX/UI, AR will now allow 3D to gain ascendancy



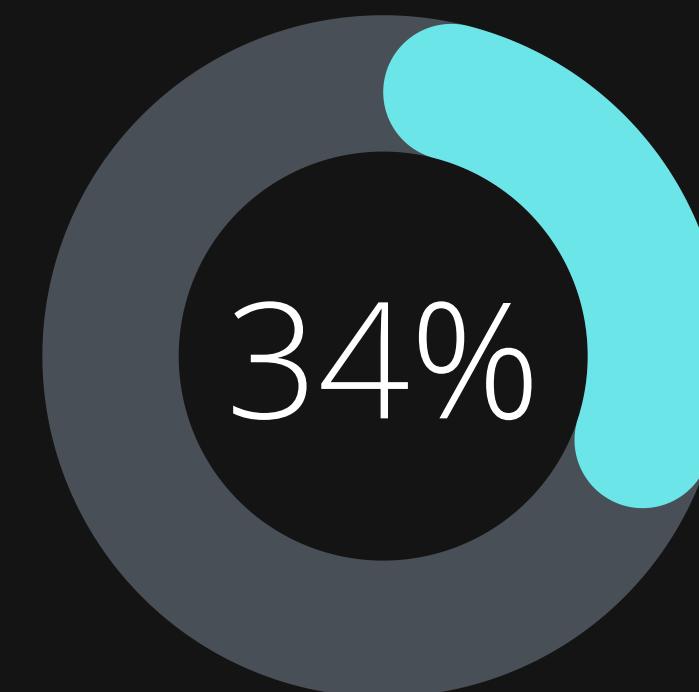


Growth Opportunities



Market growth will accelerate at a CAGR of

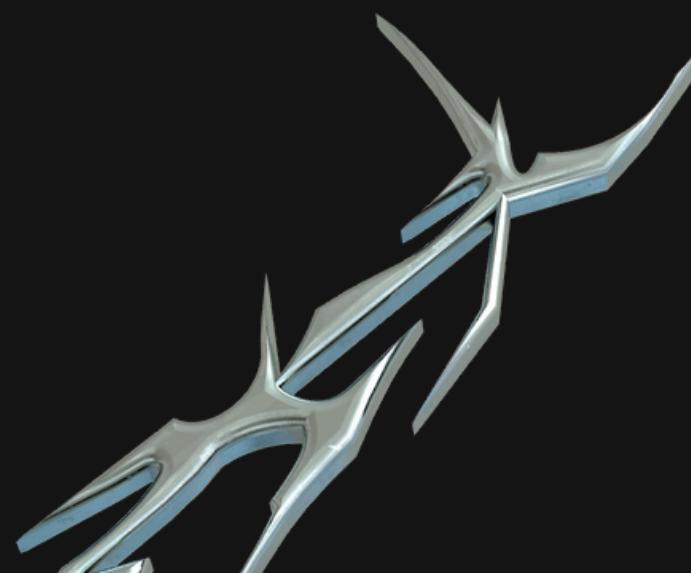
- The technology for augmented reality is new and has immense potential. Over the years, various large manufacturers have introduced numerous augmented reality applications which have presented the gamers with new ways to interact with the real world.
- The continuous rise in the number of mobile gamers has created a positive impact on the demand for augmented reality games. We expect this trend to continue during the next five years.
- China, the United States and Japan currently represent the key demand drivers for this market.



Growth Contributed by APAC



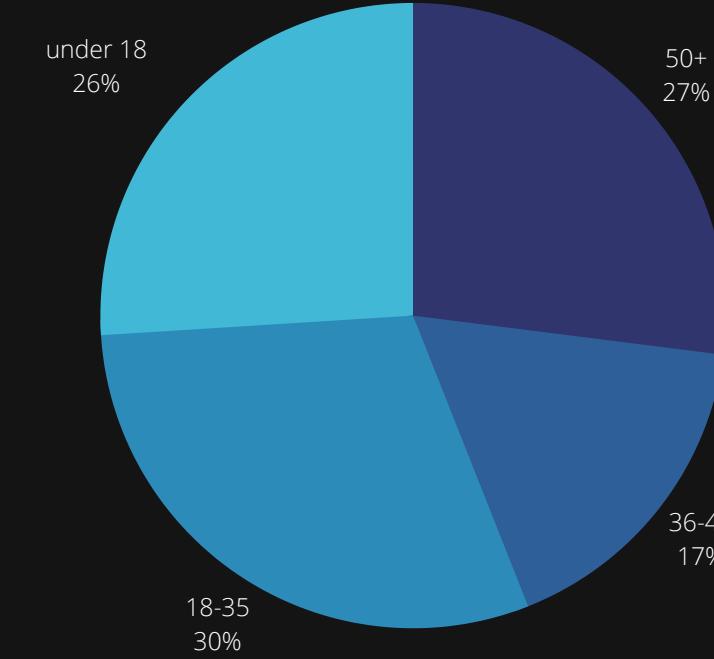
Target Audience



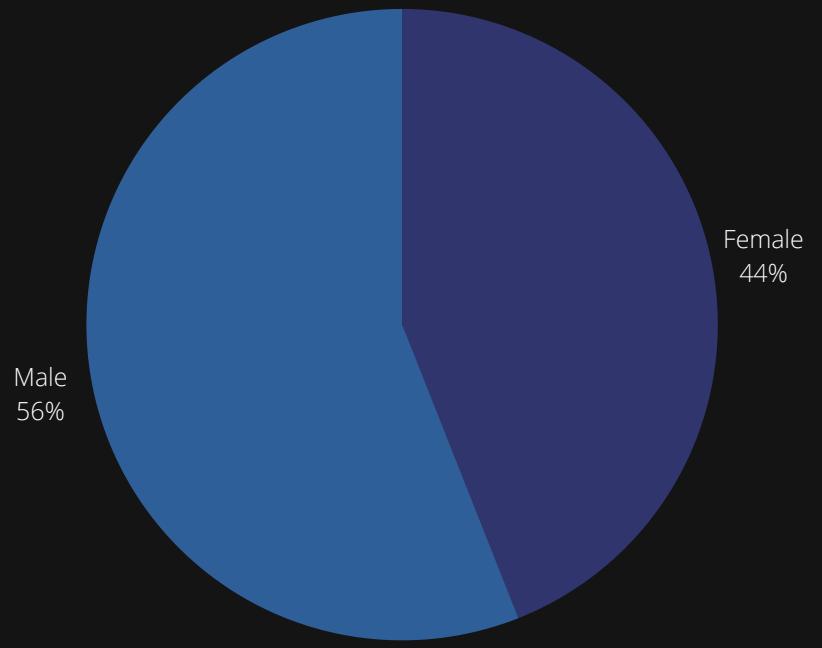
The main audience for video games is 18-35 year old men, but in fact video games are suitable for the entire population of all ages. The proportion of female players has gradually increased in recent years.

According to ADCostly, the countries/regions with the top 10 audiences for video games are:

- India
- United States
- Philippines
- Bangladesh
- Pakistan
- United Kingdom
- Malaysia
- Burma
- Nigeria
- Canada



Age

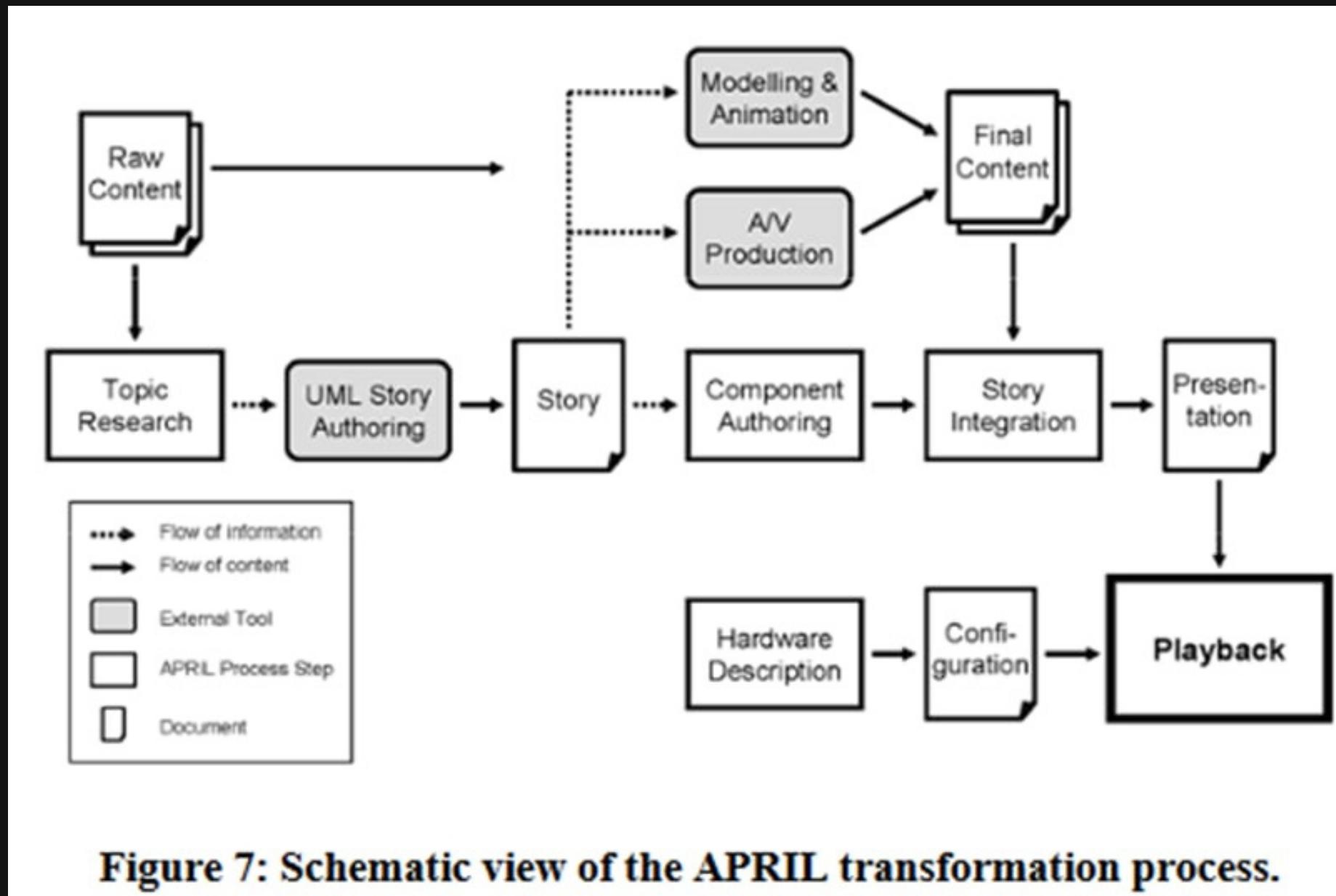


Gender

Percentage of Video Game Player



Implementation Strategy



Guide to developing AR/VR games

- Find a new game idea
- Target a device for your game idea (if you want to create a VR game)
- Choose what type of graphics your AR/VR game will have
- Find a development platform for your AR/VR game



How AR Adds Value In Gaming Industry

The use of augmented reality in gaming can enhance the gaming experience immensely.

- Augmented reality allows players to do things differently. This means that, for any given set of choices, you can go for the strategies most likely to minimize the risks.
- AR also introduces change and variety to games, in real-time. A game like Super Mario Brothers, where the characters on the screen move in exactly the same way every time, would be boring. A game in which the movement of the characters has much more flexibility is considerably more entertaining.
- AR can let us play in a multi-dimensional space. In the real world, as we all know, we can move back and forth and up and down and side to side, whereas we cannot usually do this in a game.
- AR games can be social. You can share your gaming experience with your friends, for instance. And you can collaborate with them in some fashion. AR is mixing the real world with virtual things that you can interact with.



Potential Challenges And Risks



- Security & Privacy Issues with Augmented Reality

Privacy & Security also pose significant challenges that the AR industry. Due to inconsistencies in augmented reality programming, oversight, and negligence, there is a legitimate chance of getting into trouble without meaning to do so.

- The Possibility of Physical Harm

There is still a significant possibility of harming yourself and the surroundings due to the nature of the application and lack of attention.

- Augmented Reality Technology Problems & Limitations.

Another big problem with implementing AR solutions is the technological gap between AR devices.

- Lack of Augmented Reality App Design & Development Standards

Standards are something of a universal language for a software application. It is one of the ways to secure its compatibility and contribution to the overall development of the technology.



Cost Breakdown In AR App Development

Main components of the augmented reality app development cost

As with any other app, the AR app development cost may be calculated by multiplying the specialists' rate by the time required to complete the project. Let's take a look at the factors that determine these variables.

1. AR functionality :

AR features are the most expensive part of the development. AR relies on special algorithms and sensors that determine the position and orientation of the camera for the appropriate rendering of 3D graphics at a location. The accurate location of the graphic elements enables real-time interaction with 3D objects. The more complicated the coding, the more hours specialists will spend on it, and the higher the resulting app price.

Cost Breakdown In AR App Development

2. Choice of SDK :

The choice of the SDK (Software Development Kit) may impact your cost to develop an augmented reality app in two ways. First, the right set of tools simplifies and speeds up your app development process and helps adapt the product to various operating platforms, thus saving time/efforts and reducing the cost of future fixes and product improvements. Second, some SDKs are paid, which should be considered when calculating the final augmented reality app development cost.

	Pricing	Platforms
ARKIT	\$50/month	ios,Android,Windows for tablets,smart glasses
ARcore	>\$1990/app	Android 7.0+ and ios 11>\$1990/app+
ARtoolkit	free,open-source	Android,ios,windows,Linux
EasyAR	free	Android,ios,windows
MaxST	\$50/month	Android,ios,Windows



Strategies To Improve Adoption Of AR

- Some have expressed concern regarding privacy and safety issues as the adoption of AR/VR technology for general use grows, especially for wearables such as glasses. Some privacy and safety concerns can be addressed through the development of informal social norms and by innovators and consumers, while others may require more formal policy action.
- Augmented reality (AR) and virtual reality (VR) have seen a significant rise in popularity in recent years, including applications catalyzed by the pandemic due to social distancing restrictions. Making the AR hardware devices affordable so that more people can afford it.



THANK YOU

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