Global On-Device Generative AI Market Predicted To See Rapid Growth, at a CAGR of 31.2% from 2024-2030

DALLAS, TEXAS, USA, June 18, 2024 /EINPresswire.com/ -- Key contents of the Global On-Device Generative AI Market report include:-

- Market size & Forecast segmented by Geography, Device Type, End-User and Application
- Technology trends, Impact of regulations, and Constraints
- Average B2B Price by Geography and Pricing forecast
- Growth markets based on application and devices
- Competitive landscape and market share of leading vendors

The generative artificial intelligence (AI) era has begun. Generative AI innovations continue at a rapid pace, especially in On-device applications, and are being woven into our daily lives to offer enhanced experiences, improved productivity, and new forms of entertainment. According to the latest market study by Mobility Foresights, the "Global On-Device Generative AI 2024-2030" is expected to grow at a compound annual growth rate (CAGR) of 31.2%.

Market Overview:
For a long time, the smartphone and personal computer (PC) markets have been stuck in limbo. But in recent times the industry has noticed a shift mainly due to the introduction of Generative AI in our Smartphones and other devices. On-device AI increases productivity while improving security, reducing networking costs, and lowering latency. These benefits fuel the adoption of next-generation productivity applications to drive on-device generative AI PCs and smartphones in consumer and enterprise spaces.

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Key Growth Drivers:
AI privacy and security - On-device AI inherently can helps protect users' privacy since queries and personal information remain solely on the device. This is important for consumer data, as well as providing an additional level of protection for medical, enterprise, government, and other sensitive applications.

AI performance - AI performance can be measured in many ways, including processing

performance and application latency. On-device processing performance of mobile devices has increased by double-digits with each technology generation and is projected to continue this trend, allowing for the use of larger generative AI models over time, especially as they become more optimised.

5G and edge computing proliferation: The roll-out of 5G networks and the growing adoption of edge computing architectures are creating an ecosystem that supports on-device AI. With faster connectivity and distributed processing, edge devices can leverage on-device AI models while offloading more computationally intensive tasks to the edge or cloud when needed.

Advancements in hardware acceleration: The development of dedicated hardware accelerators, such as neural processing units (NPUs) and AI-specific chips, is enabling more powerful on-device AI capabilities. As these hardware components become more prevalent and affordable, they will drive the adoption of on-device generative AI solutions across various devices and form factors.

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Market Challenges:
Data privacy and security: On-device processing can be useful as it retains the data on the device; however, it has led to new security concerns. One of the most significant concerns is preventing the possibility of someone gaining access to the model and user data of the AI device or hacking the device.

Regulatory compliance and data governance: Since on-device AI operates on sensitive data locally eliminating the need for sending it to cloud server for processing, the process of meeting different data protection regulations and privacy laws within different regions and sectors can prove to be quite challenging for the developers and vendors.

Ethical and Bias Considerations:Gen AI models learn from the input data and therefore if the input data that is fed into the system is biased, then any output derived from the AI models will also fall in the same category. This may make it produce discriminatory or unfair results that can harm the reputation of a brand. Therefore, sectors that depend on transparency as a component of operations a bias may pose significant challenges to AI adoption. That is why, it is reasonable to discuss the given ethical concerns in order to prevent resulted inequalities and injustice.

Key benefits of On-device generative AI:-

Enhanced privacy and data protection: By having generative AI models on the device, it is possible to avoid the need for uploading the user's sensitive information to the cloud or other servers. This assists in overcoming privacy issues and the ability to meet the requirements of the data protection legislation as users' data are kept safely on their handheld device.

Offline functionality: offline AI processing refers to using the in-app generative AI that applies AI capabilities in circumstances trending or lacking the internet connection, making generative AI expand its applicability in areas of low connectivity, separate industries and situations of unreliable connection to the Internet.

Reduced bandwidth and energy consumption: On the grounds that on-device AI does not send data to cloud for analysis but rather undertakes the process locally, it can be expected to be more efficient and less power consumptive, hence extending battery life of portable devices.

Low latency and real-time performance: On-device AI rules out the deployment of data to distant servers and awaiting their replies, hence supporting low latency and real-time processing for AI applications. This is especially true for applications where response should be delivered as quickly as possible, for instance natural language processing, augmented/virtual reality applications.

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Regional Insights:
The Asia-Pacific region, led by South Korea, Japan and China, will be the largest market for On-Device Generative AI, driven by leading technology companies in the region, such as Samsung, Huawei, Xiaomi, Oppo, and Vivo, are actively developing and integrating on-device AI capabilities into their smartphones, wearables, and IoT devices. These companies are aiming to provide better user experiences, improve privacy, and enable offline functionality.

As player like such as Huawei, Samsung, and Xiaomi, have already integrated on-device AI capabilities into their flagship devices for tasks like photography, voice assistants, and AR applications, paving the way for wider adoption.

USA is home to multiple players for both hardware and software in this industry along with a wide market base to accommodate the applications and requirements of On Device Generative AI, Competition to OpenAI from other startups and established players will lead to improving apps and functionalities for the users

Future Outlook:
Despite the challenges, the future of on-device generative AI presents a bright one, with both extensive development and advances seen in the upcoming years. Subsequent innovation of mobile processors, AI accelerators, and patterns of memory will bring hidden potentiality and improvement in the efficacy of on-device generative AI systems. Real-time Generative AI within devices will be the essence of the advancement of edge computing and the IoT where most computational and decision-making processes will happen at the device level instead of relying on cloud resources.

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Key Benefits for Stakeholders:-

Quantitative Market Analysis: This report delivers a quantitative analysis of market segments, current trends, estimations, and dynamics from 2024 to 2030 for the Global on-device generative AI market, highlighting significant opportunities.

Driver and Restraint Insights: Detailed insights into key factors driving the market growth, alongside major restraints, help stakeholders understand the impact of various market dynamics.

Detailed Market Segmentation: An in-depth analysis of market segmentation aids stakeholders in identifying the most lucrative niches.

Geographic Revenue Mapping: Major countries in each region are mapped according to their revenue contribution to the global on-device generative AI market.

Market Player Positioning: The report facilitates benchmarking and delivers a clear understanding of the current position of the market players involved.
Comprehensive Market Outlook: Includes an analysis of regional and global market trends, key players, market segments, application areas, and strategic market growth approaches.

Reasons to Purchase:-

Strategic Decision Support: This report offers valuable data on market forecasts, sector trends, and micro and macro details to support strategic decisions.

Competitive Strategy Development: Insights into market share and positioning of key market players aid in developing competitive strategies and positioning one's own business effectively.

Risk Evaluation: Understanding market drivers, restraints, and dynamics helps in assessing potential risks and developing risk mitigation strategies.

Market Entry and Expansion: Detailed analysis of segmented market growth, geographic trends, and regulatory frameworks assists businesses in planning market entry and expansion strategies.

Optimal Investment Planning: The report guides stakeholders in identifying regions and sectors ripe for investment, helping optimize investment strategies.

Regulatory Impact Analysis: Provides a detailed understanding of the regulatory landscape and upcoming changes, which are crucial for compliance and strategic planning.

The report provides insight into current and future potential applications, which help the stakeholder to collaborate with certain players across industries

KEY FINDINGS:-

Asia-Pacific will be the market with the largest growth from 2024-2034 followed by the USA. The market growth will occur due to the growth of Consumer electronics, especially the smartphone Market.

On-device AI inherently helps protect users' privacy since queries and personal information remain solely on the device. This is important for consumer data, as well as providing an additional level of protection for medical, enterprise, government, and other sensitive applications. Giving the user trust to utilize the AI in various task and hence unlocking new applications.

As cloud providers struggle with the equipment and operating costs associated with running generative AI models, they are beginning to charge consumer fees for services that were initially free. These charges will directly impact the overall utilization of On-device Generative AI.

Processing data locally on devices eliminates the need to transfer sensitive information to the cloud, enhancing privacy and data security. This will drive adoption in industries and regions with strict data protection regulations.

On-device AI enables more seamless experiences, improving the responsiveness of services such as augmented reality, virtual assistants and creative tools. This increases the demand for on-device AI in applications that require real-time performance.

The AI models in the device can operate without the Internet, allowing the AI to operate in environments with limited or no connectivity. This will lead to adoption in remote areas and services such as transportation and logistics.

On-device generative AI will play a key role in enabling advanced AR and MR experiences, enabling real-time generation and interpretation of digital objects. This will shape the market for participatory technologies in gaming, retail and entertainment.

Handling user data locally creates a more personalized and personalized experience. This will differentiate AI solutions on the device in competitive consumer markets.

On-device generative AI is a key enabler of edge computing and the Internet of Things (IoT), allowing real-time data processing and decision-making on edge devices This will lead to internal

adoption of smart cities, industrial automation, and other IoT applications.

Upcoming regulations on data privacy, AI ethics, and device security will shape the development and implementation of on-device generative AI, ensuring functional and reliable AI systems thereby providing opportunities for solutions aimed at setting industry standards.

"While the market for on-device generative AI is still in its early stages, the combination of technological advancements, and consumer demand is driving rapid growth and innovation in the field, Among various regions Asia-Pacific and USA emerging as global leaders in on-device AI solutions."
- Abhishek Kishor

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ON-DEVICE GENERATIVE AI MARKET TRENDS:-

Hardware Acceleration: Indeed, the rapid advancement of purpose-built AI accelerators like NPUs and AI-specific GPUs is fueling on-device generative AI. These hardware components enable the computation capability and energy constraint which is needed for real-time AI processing on an edge device.

Model Optimization: technologists and scientists are working towards building one lightweight and performant machine learning models that would be suitable for deployment on these constrained form factors. These strategies include, model pruning, quantization and knowledge distillation are being practiced in order to achieve limited model size and impressive performance on the final device.

Edge Computing and Internet of Things (IoT): Whereas conventional deep learning models are transmitted to the cloud for inference, on-device generative AI is instrumental in edge computing IoT use cases, where compute and decision making need to happen on the device without the need for internet accessibility. The motivation to adopt this solution is founded on dynamic response, confidentiality, and the ability to work in an environment with interrupted connections.

Augmented Reality (AR) and Virtual Reality (VR): AR and VR have been enhanced for application on the device due to the real-time generation of content and rendering instruments all from the application. This trend is influenced by the increase of the prospects for entertainment, recreation, purchases, and other spheres that came with innovations in gaming and entertainment industry.

Personalization and Customization: As generative AI works on this data locally within an OS or software application, it provides users with highly individualized and tailored content. Closely

related is the trend in media, content, and creative applications that are personalized according to users' habits and choices – from virtual assistants and content suggestions to productivity apps with unique customized features.

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THIS REPORT WILL ANSWER FOLLOWING QUESTIONS:-

- on-device generative AI market size and forecast, By Geography, Device Type, End-User and Application.
- Competitive landscape and market share of Top Players.
- Key drivers and restraints shaping the growth of the on-device generative AI market.
- Technology trends and related opportunities Component Manufacturers and suppliers for on-device generative AI.
- Shift in the semiconductor technology used in on-device generative AI.
- Effects of regulations and policies imposed in various geographies and impact on the growth of the on-device generative AI market.
- Impact on on-device generative AI due to Technological development across entire generative AI Market.
- Current and upcoming devices, and impact on the on-device generative AI Market.
- Unmet Needs And Market Opportunity For Suppliers.
- The potential entry barriers and risks for new players entering the on-device generative AI market.

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