SE Seminar #7 Report

5G Technology for for industrial 4.0

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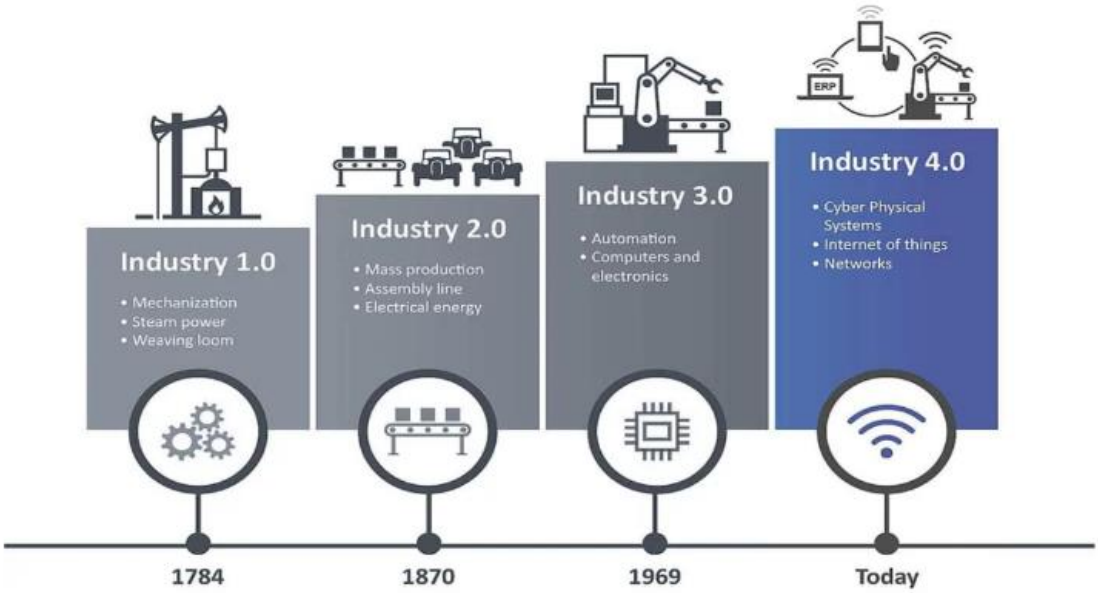
Introduction

In this seminar, Mr.Poohmipat Sripakdee, a special speaker, discusses the topic "5G Technology for for industrial 4.0."

Why opt for 5G?

- When the expense or challenges of installing fiber connections are too high, 5G makes Fixed Wireless Access a feasible alternative.
- 5G offers the necessary speed and responsiveness to completely fulfill the usual requirements of residential users.
- Utilizing network slicing enables the creation of various levels of residential connectivity demands within 5G NR+CN networks.



Evolution

Consumer demand and value proposition:

- Consumers now expect ultra-high-speed broadband access, a requirement reinforced by government regulations in numerous nations.
- Although Fiber-to-the-Home (FTTH) is generally the most economical means to provide this service, in certain areas, the feasibility of deploying fiber directly to specific premises may be hindered by distinct costs or restrictions.

5G Video

UHD Video – Live Broadcasting via 5G

<u>Consumer demand and value proposition:</u>

• Growing desire for high-quality live broadcasts of both scheduled and impromptu events, unrestricted by location.

• UHD video requires cellular uplink throughput ranging from 25 Mbps to well over 1 Gbps for single or multiple feeds.

• The advanced capabilities of contemporary smartphone cameras also empower non-professionals, such as vloggers, to tap into this potential.

5G Multi-view / Immersive Events

Consumer demand and value proposition:

- Enhancing audience engagement is achievable through multi-screen viewing, allowing viewers to select their preferred visual perspectives.
- Viewer expectations necessitate HD+ video resolution, closely synchronized with the live action view.
- Integration with targeted advertising and social media interaction further adds relevance to the immersive experience.

5G-Enhanced Video Analytics for Industry

Consumer demand and value proposition:

- Within industrial automation, video analytics and photogrammetry are progressively vital for identifying irregularities in operational workplaces, assets, and processes.
- The crucial need for accurate and timely anomaly detection underscores the growing importance of ultra-high-quality imaging delivered with minimal latency.
- Cameras, whether stationary or mounted on robots or drones, enable complete automation of activities in this context.

5G in eGaming

Consumer demand and value proposition:

- In 2017, the gaming industry yielded $108.4 billion in revenue, with $59.2 billion attributed to mobile gaming. The eSports sector was projected to become a $1 billion industry in 2018, boasting a global audience of 258 million viewers.
- E2E latency aspirations for eSports gamers hover around 10ms.
- The scarcity of fiber availability and the desire for wireless flexibility drive the case for 5G in meeting these gaming demands.

5G Mixed Reality Team Sports

Consumer demand and value proposition:

- 5G effortlessly delivers the low latency required to synchronize high-definition augmented content with dynamic team actions. It also possesses the capacity to support high-resolution video feeds to both local and remote audiences, while its location-independence enables spontaneous game creation. The interference-free connectivity of 5G can accommodate a multitude of connected devices.
- The increasing popularity of mixed reality team games like HADO serves as a glimpse into the potential realized with 5G, showcasing reliable, low-latency wireless connectivity and genuine location independence.

5G AR-Enhanced Tourism

Consumer demand and value proposition:

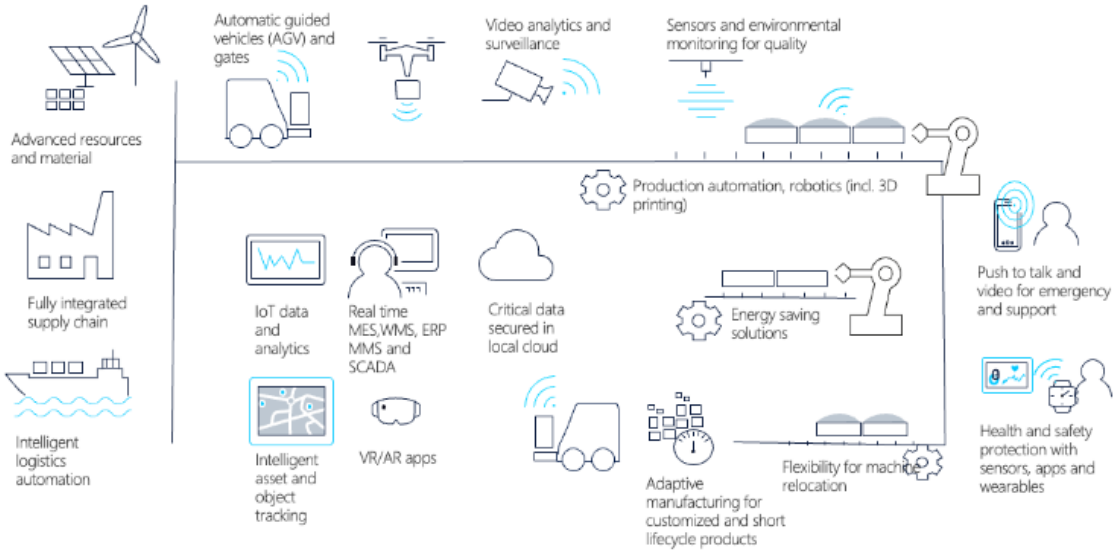
- 5G offers robust capacity for streaming HD video-rich contextual information, ensuring low latencies that synchronize seamlessly with tourist actions or selections.
- Initial 5G rollouts prioritize comprehensive indoor and outdoor coverage for prominent tourist attractions, ensuring interference-free connectivity for a multitude of connected devices and clients.
- Beyond being an opportunity, there is a growing expectation among today's consumers to access additional streams of contextual information linked to their activities.
- Tourists highly value the capability to receive relevant information in their preferred language, encompassing various tourist attractions.
- The advancement of AR headsets is anticipated to further enhance this opportunity.

5G Smart City Environmental Monitoring

<u>Consumer demand and value proposition:</u>

- 5G (Release 16+) is optimized for massive Machine-to-Machine (M2M) connectivity, supporting a wide array of sensor types.
- Network slicing in 5G NR+CN enables operators to establish multiple virtualized networks, each tailored to the characteristics of specific sensors and use cases.
- Release 16+ is expected to integrate evolved versions of current 3GPP LPWA interfaces into the 5G Core Network.
- Environmental monitoring solutions prioritize public quality of life aspects, including concerns like air and water pollution, flooding, and noise.
- Measurement sensors, often placed in inaccessible locations throughout a city, require long-lasting battery-powered connectivity solutions with exceptional indoor and outdoor coverage, such as LPWA IoT.

Wireless connectivity enables conscious factory use cases



5G Vehicle-to-Everything (V2X) & Intelligent Traffic Management

Consumer demand and value proposition:

- V2X solutions, including LTE and DSRC, address various connectivity needs, but 5G stands out with unparalleled flexibility to meet all V2X multi-service requirements. This includes exceptional capabilities in terms of latency, reliability, and capacity, ensuring interference-free connectivity for a multitude of connected devices and clients.
- End-to-End (E2E) network slicing in 5G NR+CN supports multiple network slices, allowing for multi-tenant and multi-application specific network configurations tailored to each V2X requirement.

V2X encompasses evolving communication standards for interactions between vehicles (autonomous or human-controlled), infrastructure, humans, and networks. The objective is to support safety and efficiency-focused solutions, representing an evolution towards intelligent transport systems. This involves the management of traffic flow through vehicles and infrastructure, utilizing cameras, traffic lights, road tolling infrastructure, and signs.

What I Have Learned:

In conclusion, exploring the diverse applications of 5G technology reveals its transformative impact across various sectors. From the immersive experiences in eGaming to the enhanced capabilities in tourism and intelligent traffic management through V2X solutions, 5G stands out for its exceptional flexibility, low latency, and high reliability. The ability of 5G to meet the evolving demands of end-users, whether in the context of augmented reality, environmental monitoring, or communication between vehicles and infrastructure, underscores its significance as a driver of innovation and efficiency. The tailored network configurations provided by E2E network slicing further emphasize 5G's adaptability to meet specific needs, promising a future where connectivity seamlessly integrates into diverse aspects of our lives, offering unparalleled experiences and solutions.