

# PNG Innovation

The digital economy as a driver of  
growth and prosperity



# WHAT IS HAPPENING?

**TECHNOLOGY  
AND  
CONVERGENCE**

**EXPONENTIAL  
GROWTH**

**ACCELERATING  
RETURNS**

**COMPUTE POWER  
GOES UP AND  
COST GOES  
DOWN**





**65% of children today will hold jobs  
that don't yet exist**

---



**40% of existing degrees will be obsolete**

---



**AI (95%) more accurate than dermatologists  
(87%) in skin cancer detection**



**In 2030 the largest internet company will  
be education company with avatar  
instructors**



**Software developers more valuable to  
companies than money**



# What is Changing?

**Behaviour** more public lives, we build communities, share, communicate, collaborate, access information, and shape our personal experiences.

**Technologies** ChatGPT is forcing us to rethink human jobs; big data gives us insight into how we work and how customers transact with us; and collaboration platforms give us the ability to connect our people and information together anywhere, anytime, and on any device.

**Millennials** By 2020, millennials 50% of the workforce, and by 2025 75%.

**Mobility** Where you are located doesn't matter if you have internet

**Globalization** Boundaries do not exist. The world is becoming just like one big city.

# The Future of Work Will Drive Education

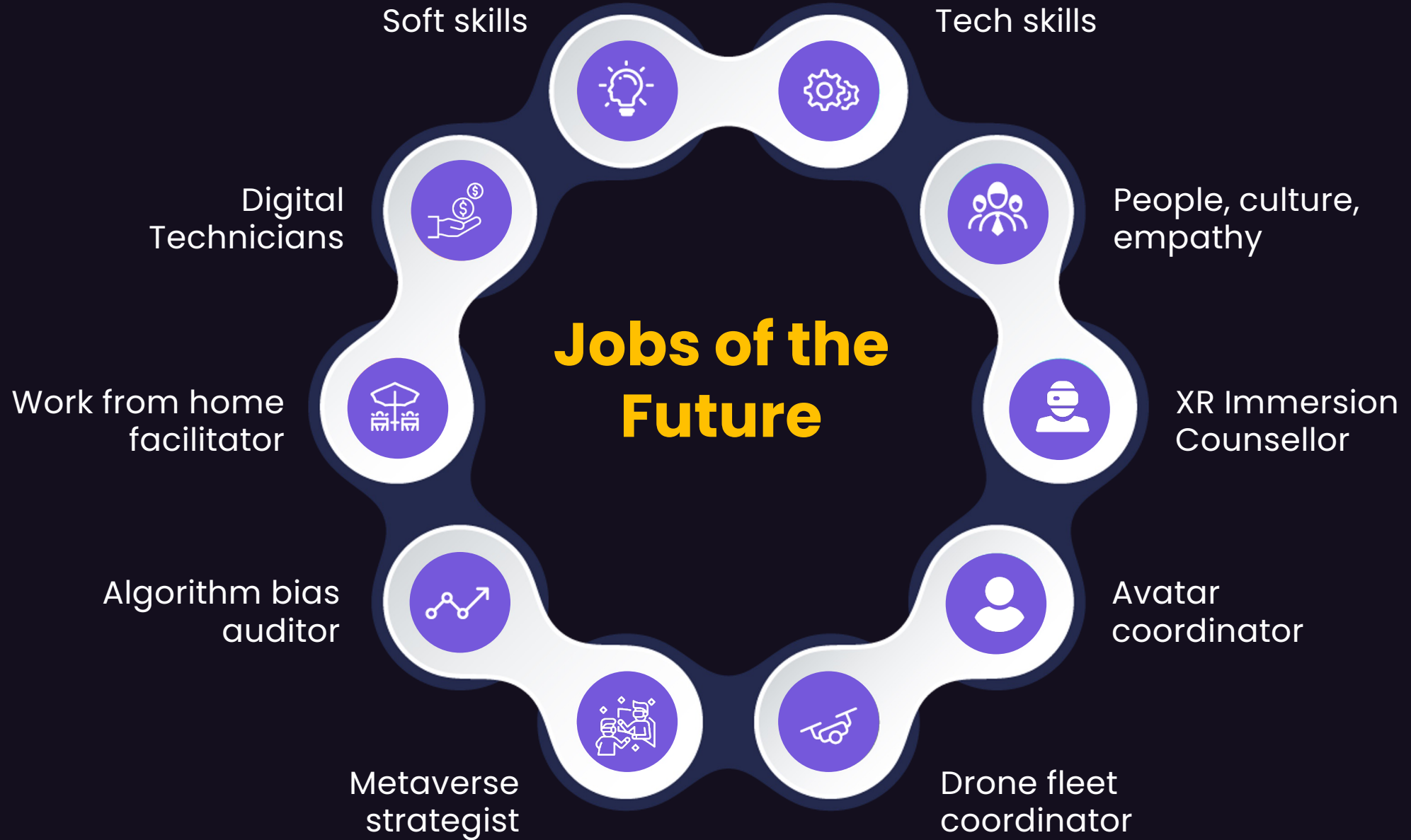
## Growth Jobs

- Computer software, data scientists, statisticians, web developers etc
- Health Care, Entertainment and Technicians

- **60 percent of new jobs (2030) will be in occupations that won't require a degree.**

**(BLS)**

# Jobs of the Future



# Future of Work

Gig Economy

Soft skills: critical thinking,  
leadership and complex  
problem-solving

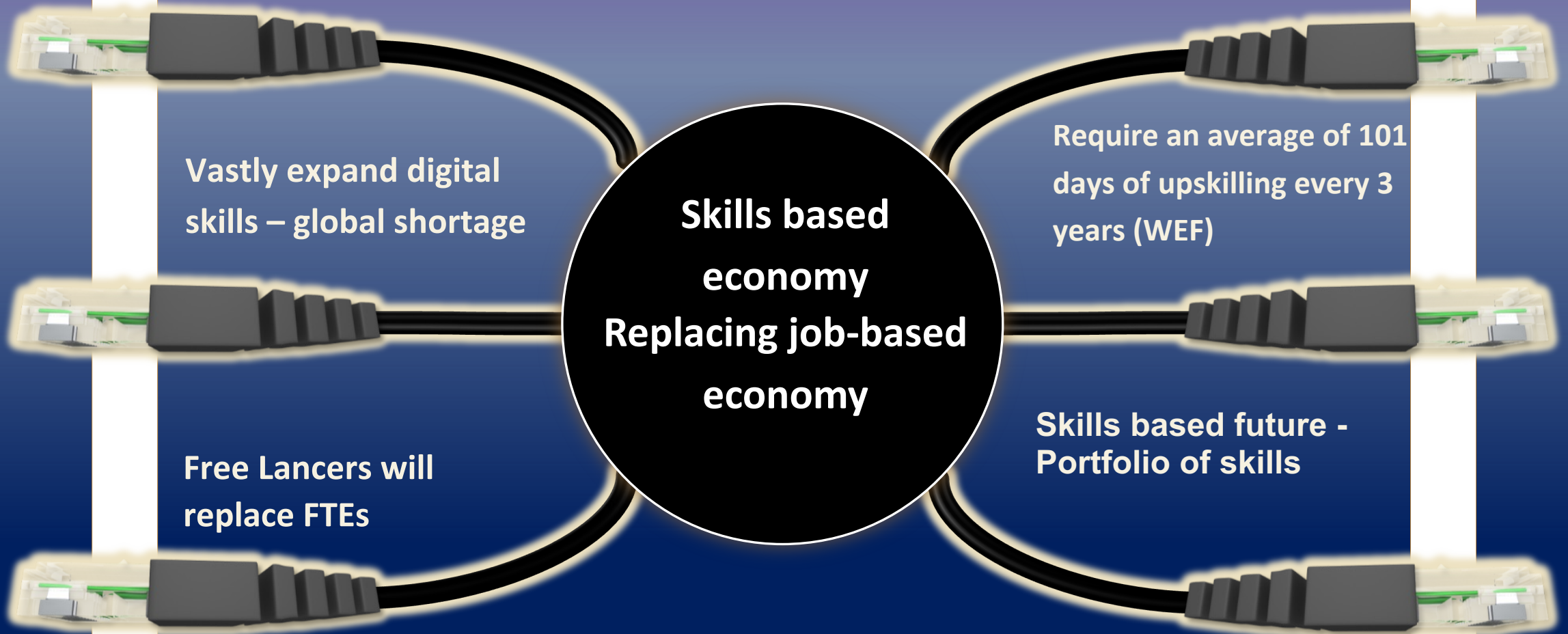
Vastly expand digital  
skills – global shortage

Require an average of 101  
days of upskilling every 3  
years (WEF)

**Skills based  
economy  
Replacing job-based  
economy**

Free Lancers will  
replace FTEs

Skills based future -  
Portfolio of skills



# Education

Rise of continuous Learning

Curated, interactive, personalized learning using AI and data

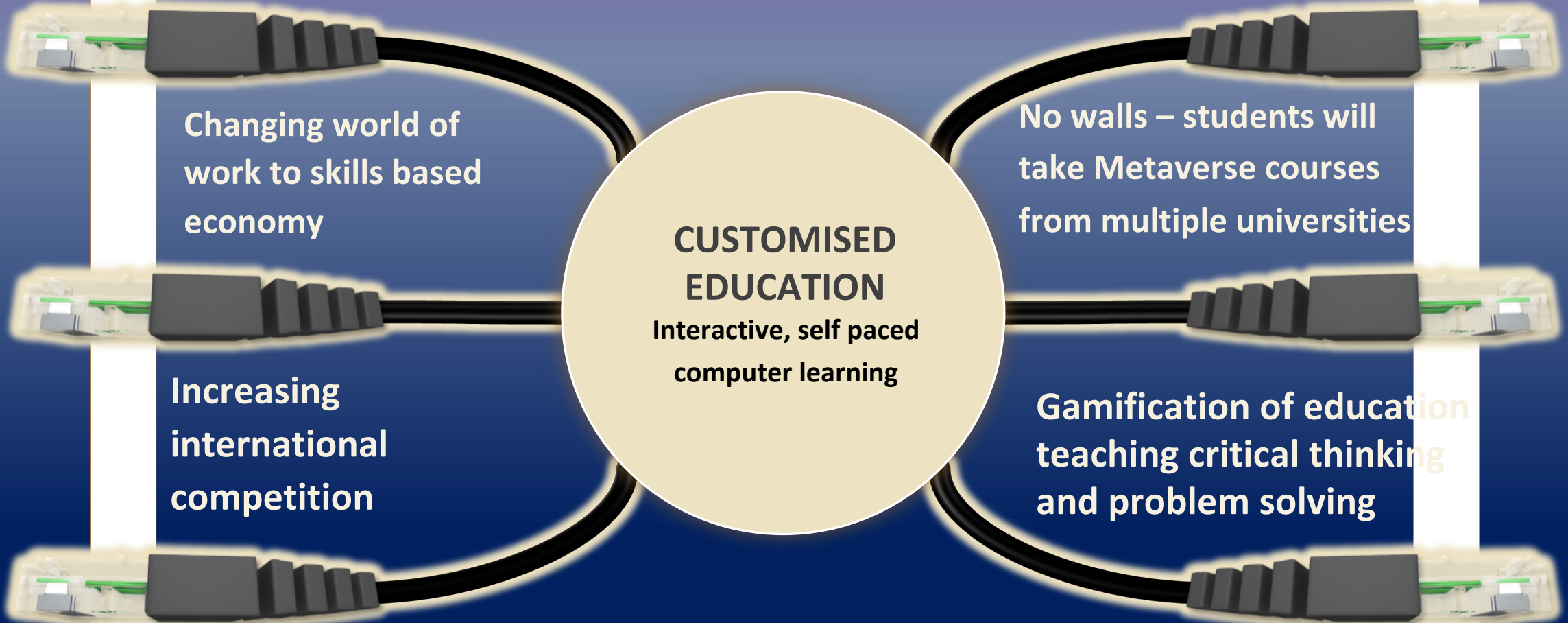
Changing world of work to skills based economy

No walls – students will take Metaverse courses from multiple universities

**CUSTOMISED EDUCATION**  
Interactive, self paced computer learning

Increasing international competition

Gamification of education teaching critical thinking and problem solving





# Digitalization



70 % of SDG  
Targets can be  
accelerated  
through digital  
technology



# Digitalization

Creates jobs 10 point increase in digitization score leading to a 1.02 percent drop in unemployment

Greatest employment effect in emerging digitized economies.

Increases growth - 10 percent growth in digitization score increases growth by 0.75%

Enables entrepreneurial businesses to overcome long-standing obstacles to reach new potential customers.

# Key Trends



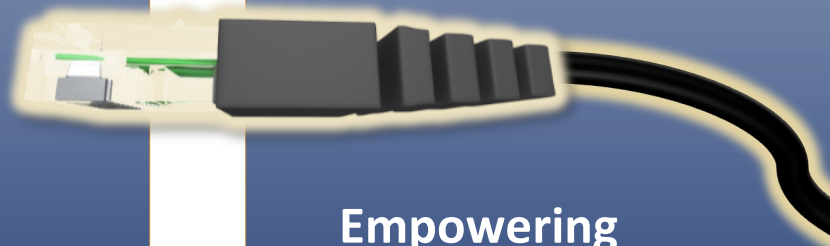
1. **Datafication** Everything will be digitized – data will be most valuable commodity
2. **Dematerialization** Reduction in materials used and exchange of services providing access rather than ownership.
3. **Platformization** Platforms scale by growing their networks; the more significant their network, the greater their value.
4. **Social and Resource Value** Different forms of value, such as green bonds, social impact bonds, company loyalty schemes, and carbon accounting.



**Data is the new  
gold**



# You will own your own data



**Empowering  
people with  
personal data  
wallet**





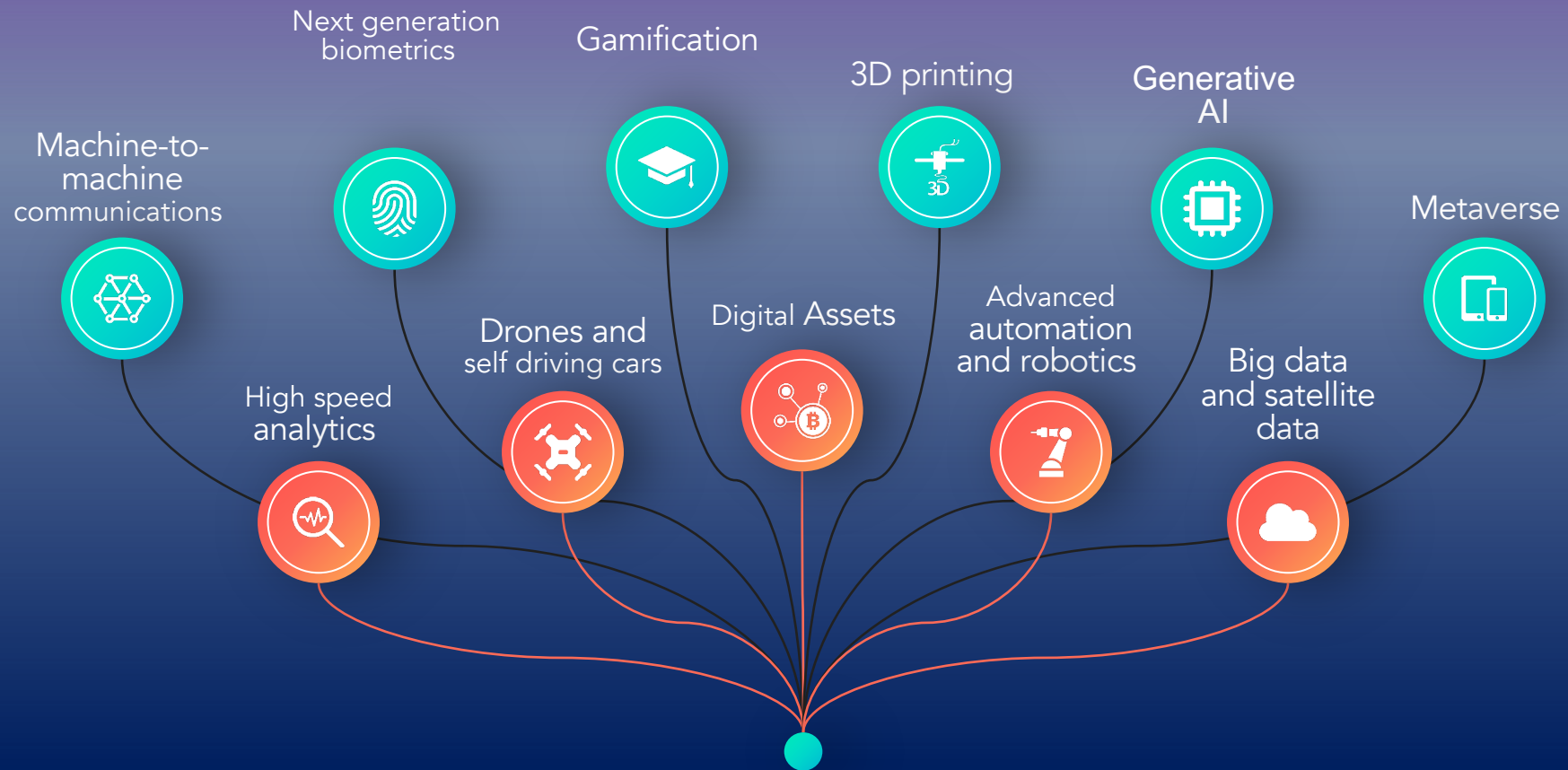
# Gen Alpha



- Most technologically advanced generation ever.
- Will not know life without artificial intelligence, augmented reality, and gaming.
- This will impact on approach to learning, work, how they socialize and how they spend money.

***Companies need to explore the best ways to combine the virtual and physical worlds of their products and services for Gen Alpha***

# THE FUTURE IS NOW!



# EMERGING TECHNOLOGIES

1. AI, Machine Learning, and Big Data
2. Blockchain
3. Digital Twins
4. GIS and Satellite Imaging
5. Information & Communication Technology (ICT)
6. IoT and Sensors
7. Robotics
8. Smart Infrastructure
9. Spatial Mapping





# AI, MACHINE LEARNING, AND BIG DATA

**Data analytics** data collection, monitoring, cleaning, integration, analysis, visualization, and prediction

**Automation:** control and navigation of monitoring robots

**Digital Twins** virtual copy of any physical thing

Data Analytics

**Machine learning algorithms** can help forecast the supply of low-carbon power technologies, such as wind and solar

**Predicting supply and demand** makes it possible to have cheaper and cleaner fuels to power the base load and react to unforeseen events that require a spike in demand.

Machine Learning

**Efficient Energy Use**  
Renewable energy requires a more accurate forecast of renewable power and demand.

Predicting supply and demand makes it possible to have cheaper and cleaner fuels to power the base load and react to unforeseen events that require a spike in demand.

**Optimizing Systems Control:** AI can be used to reduce energy usage.

Efficient Energy Use

**Forecasting:** AI can be used for forecasting by absorbing historical data, analyzing these data, and producing more accurate forecasts than available forecasting tools.

Optimizing forecasts for agricultural yields. AI forecasting can help increase the efficiency and optimization of climate models.

Forecasting

# BLOCKCHAIN

## Smart Grid Management

Increases the speed of exchange, minimizes transacting backlog and overall costs, improves data availability and reliability, and ameliorates auditability as records are verified in near real-time and can be used to convey titles of physical commodities seamlessly between market participants.

## Peer-to-Peer Energy Markets

Improves and manages smart grids in decentralized energy markets and allows for reliable and transparent peer-to-peer trade of power. The rapid adoption of smartphones in West Asia makes it possible for solar panels to be connected to blockchains enabling consumers to benefit from distributed generation.

## Market Platform for Renewable Energy Certificates

Incentivizes the leveraging of renewable energy investment to create an alternative revenue stream for renewable energy via an open-source tool to build digital platforms for easily registering users and devices, tracking renewable energy, and issuing, trading and claiming corresponding energy attribute certificates in a regulatory compliant way.

## Micro-leasing marketplace

Enables the distribution and receiving of funds digitally between various investors and recipients of these funds, while increasing transparency.

## Digital Measurement Reporting and Verification

Structured data collected via Internet of Things (IoT) and secured on a blockchain in combination with digitized Measurement Reporting and Verification methodologies increases the trust and utility of the data to support more efficient and effective decision-making and solutions for climate and sustainability.

## Non-Fungible Tokens (NFTs)

NFTs are increasingly being used for climate change with initiatives ranging from awareness-raising to fundraising and as an immutable record for impact and carbon credits.

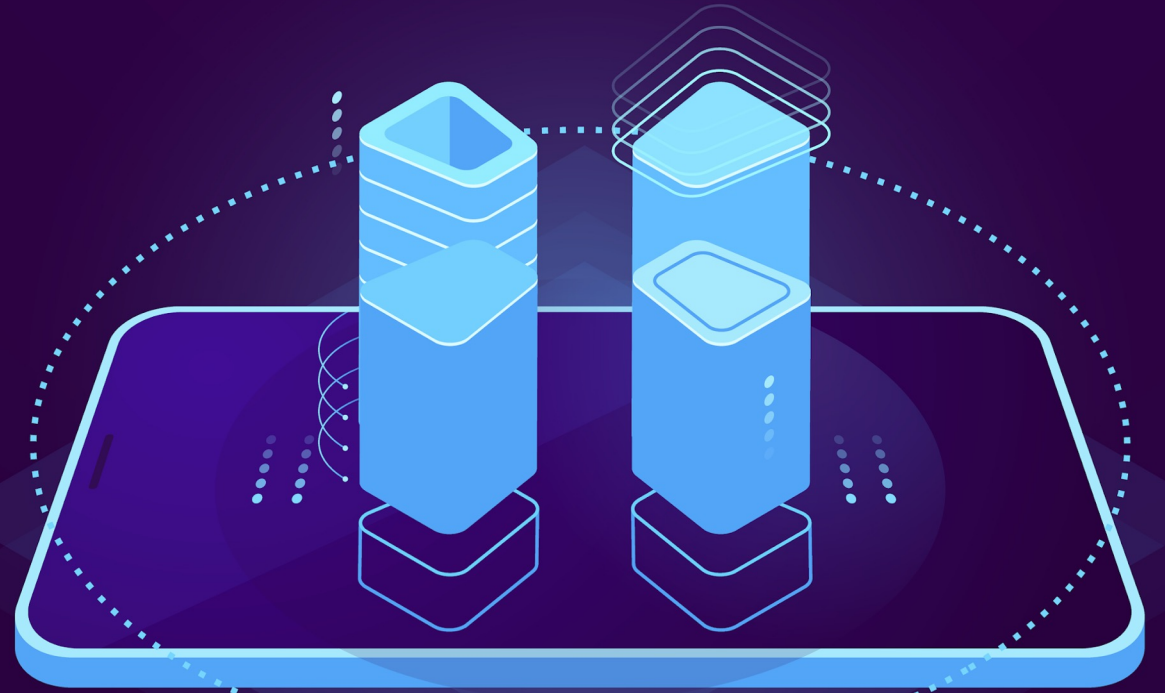


# DIGITAL TWINS

Allows examination of climate projections and rainfall with hydrological models, and see what effect that would have on flooding over the coming decades.

Allows forecasting of where a flood would occur

Simulate the impact of natural disasters on networks through real-time interaction and accurate 3D registration of virtual and real objects using Augmented Reality



# OTHER EMERGING TECHNOLOGIES

## GIS & Satellite Positioning

- Geospatial data collection of habitat information and accurate measurements of forest borders to support preservation efforts
- Geospatial sensing and monitoring of emissions and air quality

## Social Changes with Mobile

- Remote working: reducing transportation, heating, and cooling emissions
- Crowdsourced monitoring using smartphone apps
- Repurposed smartphones create early warning systems

## Internet of Things (IoT) & Sensors

- “Internet of wild things” that monitors habitat changes and prevent animal poaching
- Remote monitoring of emissions, air quality, and climate indicators
- Early warning networks to detect signs of critical climate phenomena, or unwanted human presence in protected areas

# OTHER EMERGING TECHNOLOGIES

## Robotics

- Solar-powered monitoring robots, autonomous robots and drones create early warning systems to detect unusual environment indicators or climate patterns

## Smart Infrastructure

- Smart Grids: household energy efficiency, monitoring energy consumption, and maintaining efficient use of energy: reducing energy loss
- Smart Transportation: autonomous driving: optimizing fuel consumption
- Smart buildings and cities: mitigating building inefficiencies through sensors and analytics

## Spatial Mapping

Latest advances in GIS, AI, and Data Analytics, to identify Essential Life Support Areas.

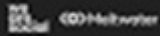
The result is an interactive map that governments can use to develop policies and prioritize areas for protection, management, and restoration.



## DIGITAL 2023

PAPUA NEW GUINEA

THE ESSENTIAL GUIDE TO THE LATEST CONNECTED BEHAVIOURS



# PNG 166/190 for digital development

(World Bank's Digital Adoption Index)

# 67.9 percent offline





# PNG Digital 2023

- **3.29 million** internet users
- Internet penetration **32.1 percent**
- **872.9 thousand** social media users
- **8.5 percent** of the total population.
- **3.74 million** mobile connections
- **36.5 percent** of the total population





# Mobile

**36.5 percent** of the total population in January 2023.

Mobile connections increased by **374 thousand** (+11.1 percent) between 2022 and 2023.



# MOBILE CREATES OPPORTUNITY!

Mobile technologies generated \$4.5 trillion of economic value added, or 5 percent of GDP globally (2021)





# Social Media 2023

**Facebook** had **844.9 thousand** users

Facebook's ad reach **8.3 percent** of the total population

**Instagram** had **59.0 thousand** users

**LinkedIn** had **310.0 thousand** users

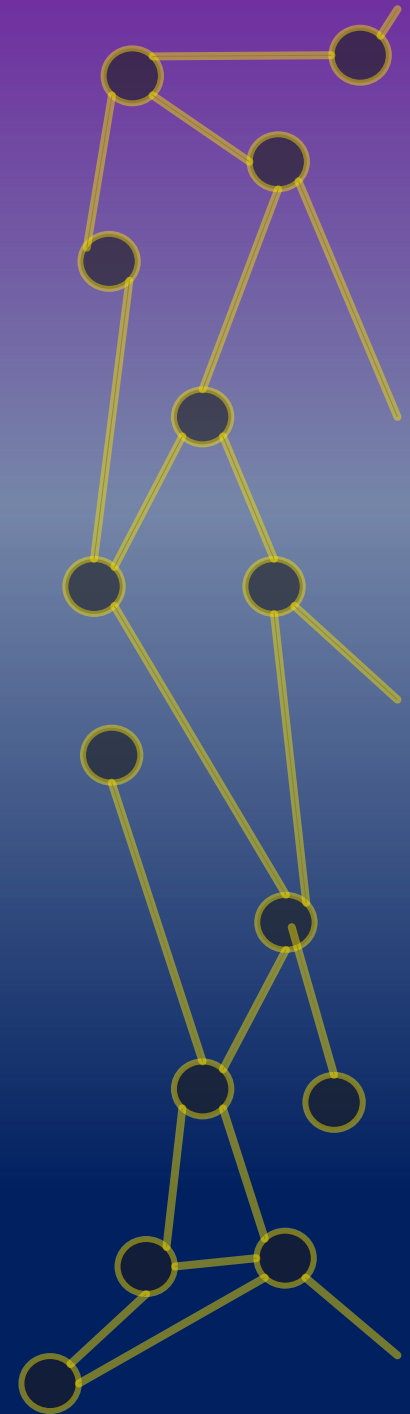
LinkedIn's potential ad reach **increased by 70 thousand** (+29.2 percent) between 2022 and 2023.

**Twitter** had **14.1 thousand** users



# EMERGING ECONOMIES

- 📦 **Size and Scale** – *Over 1 billion smartphone users in China and India compared with only 220 million in the US*
- 📦 **Youth Bulge** - *Emerging markets home to 85% of the global population, where nearly 90% of people under 30 reside*
- 📦 **Mobile Penetration** - *unique mobile subscribers 5.9 billion by 2025, (71% of the world's population). Growth will be driven by developing countries,.*
- 📦 **Massive Challenges** – *2 billion unbanked, 1.5 billion with no ID, 2.5 billion with no electricity*
- 📦 **Agile Governments** – *nimble – lack of legacy systems a boon to technological innovation*





# Emerging Economies Could Grow Twice as Fast

6 of 7 largest economies (2050) projected to be emerging economies - China (1st), India (2nd) and Indonesia (4th)  
**(PWC)**

- **Invest in digital infrastructure**
- **Expand internet access**
- **Promote digital literacy programs.**
- **Create policies and initiatives to foster digital innovation and entrepreneurship.**

# Top 10 Digital Emerging Economies 2023



1. China,
2. India,
3. Indonesia,
4. Russia,
5. Mexico,
6. Turkey,
7. Brazil,
8. Saudi Arabia,
9. Malaysia,
10. Thailand.





## TOP TECHNOLOGIES OF STRATEGIC IMPORTANCE

1. Agriculture technologies
2. Education and workforce technologies
3. Financial services and capital markets
4. Health care technologies
5. Power storage and generation
6. Artificial intelligence
7. Climate change mitigation technology
8. E-commerce and digital trade
9. Environmental management technologies

# NEXT BILLION ASIAN CONSUMERS





# Asia

## On Our Doorstep

### INDONESIA

Young and tech-savvy population  
Rapidly expanding e-commerce market  
Successful tech startups (Grab, Gojeck)

### VIETNAM

By 2030, Hanoi set the target for the digital economy to make up 30% of the gross regional domestic product Hanoi will complete the digital infrastructure as a platform for developing a digital government and economy.

Set to be a center for startups and innovation in Asia



# Food Production

In the next three decades we will need a 30-70 percent increase in food availability to meet the demand from an increasing population.

- ❑ PNG has the next billion Asian consumers on its doorstep
- ❑ Asia's urban population share almost doubled in 30 years – and it is expected to reach 70% by 2050. They need to eat.
- ❑ Green revolution is a \$50 trillion opportunity
- ❑ Solar and renewable energy
- ❑ Sustainable agriculture with modern technologies and fair distribution systems, create new food production hubs





# Game Changing Agri-Tech

Change the way food is produced, processed, traded, and consumed.

- ❓ **Nanoclay** - In the Arabian desert scientists have created lush fruit farms with the addition of clay and water.
- ❓ **Solar power** in Qatar and Jordan, are powering desalination systems that irrigate plants in and around greenhouses.
- ❓ North China's Inner **Mongolia Autonomous Region**, has **over 70 kinds of crops growing** Using a **new technology paste** that is made of a substance found in plant walls. When it's added to sand, it's able to retain water, nutrients and air.
- ❓ In Israel, **robots and hydroponics** are being used to grow food indoors.
- ❓ Between Australia and the United States, there's a hundred million square kilometres of ocean desert that is amenable to **Marine Permaculture**." (Dr. Brian von Herzen, Climate Foundation)



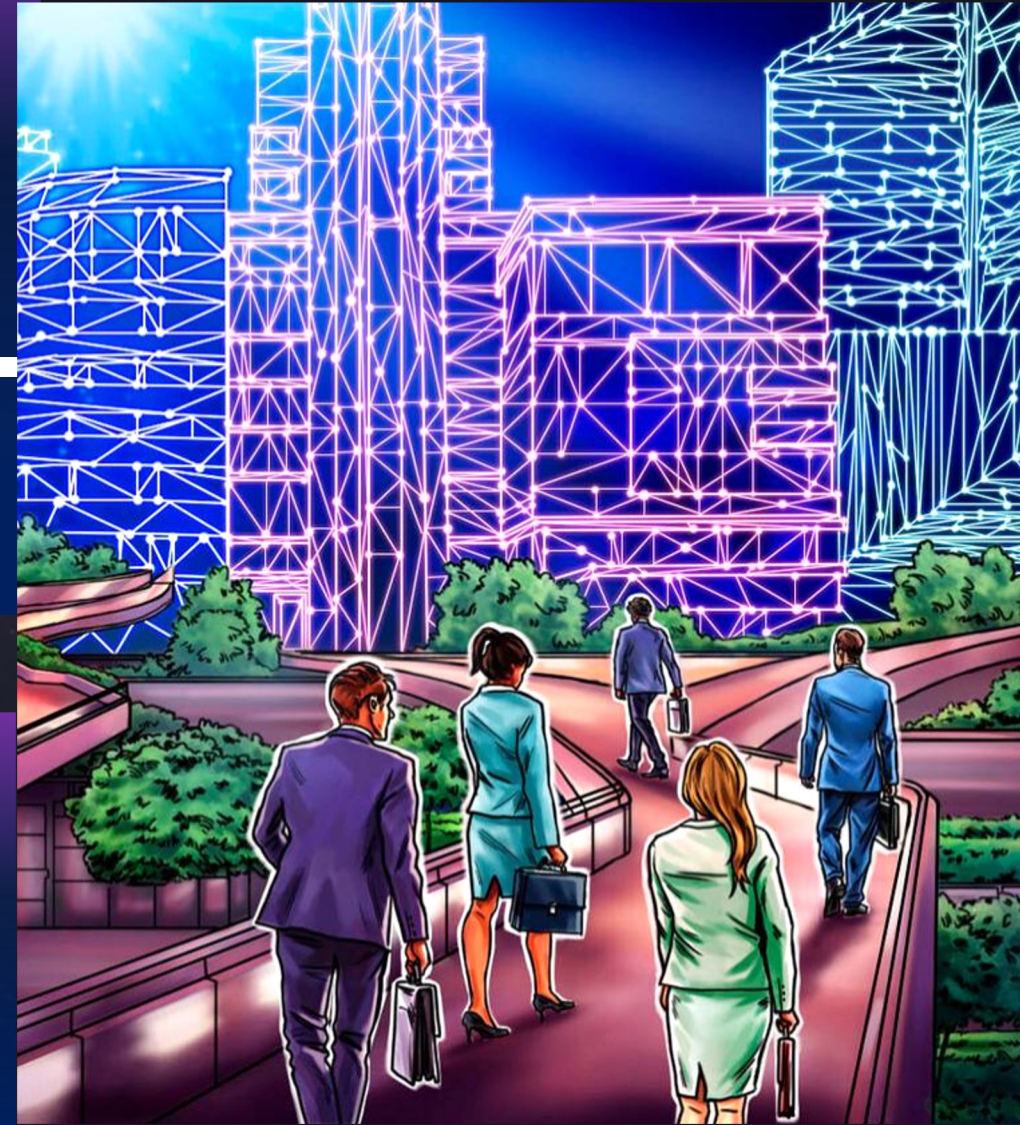


# Metaverse

Confluence of -  
gaming - blockchain -  
AI - AR/VR

Immersive digital  
ecosystem

\$13 Trillion Market 2030 (Citi)



# Immersive Education

1. Immersive and interactive learning experiences
2. Personalized and self paced learning
3. Access to knowledge and resources from anywhere in the world 24/7
4. Experiential learning and authentic environments
5. Development of communication, collaboration, and critical thinking skills
6. Increased engagement and motivation for learners
7. Increased global connectivity and cultural exchange







# GAMING

**MOBILE 2.7  
BILLION  
US (2022)\***

- 79% of people under 22 years of age play mobile games



# ESPORTS

- To grow from **\$1.44 billion** in 2022 to **\$5.48 billion** by 2030.
- **CAGR of 21%**
- The global esports audience is expected to grow to **577 million** people by 2024.

**Tens of millions \$\$\$** in prizes for competitors and revenue for the organizers.

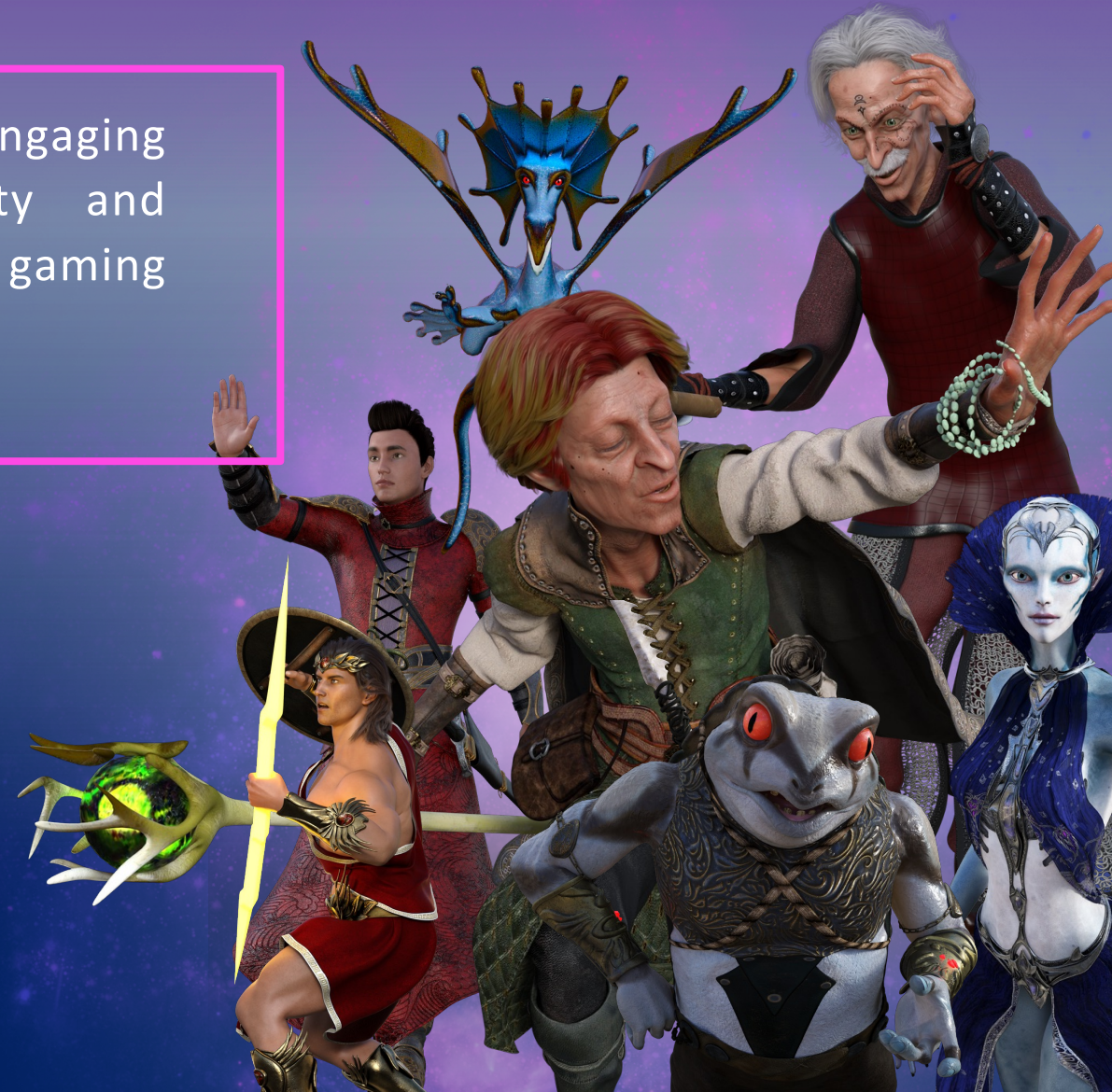


**Dota 2  
International,  
League of  
Legends Worlds**



# PLAY & EARN GAMES

Combine financial rewards of P2E gaming with engaging gameplay experiences, focusing on sustainability and attracting players for earning potential and enjoyable gaming experience.





# Government

Political leadership - Talent access - Finance & Investment - Infrastructure.



1. Policy frameworks that foster digital innovation and growth
2. Develop new segments via the digital economy
3. Talent development and job creation within new segments
4. Mobilize finance for digital economy
5. Diversify trade (via eCommerce and online services)
6. Bridge digital divide and provide basic infrastructure
7. Get everyone on line

# Mobilize Finance

Attract and develop investment instruments like government backed bonds to provide for investment in promising tech and digital companies.







# Infrastructure

- Internet access will be a basic human right
- Champion connectivity for all
- Use mechanisms like Tax Credit Scheme for Internet Access

# Digital Opportunities



1. Fintech – Remittances – Forex – Financial inclusion
2. Supply chain
3. Collateralize customary lands to raise productive capital
4. Digital identity
5. Digitization of assets
6. Green economy, green energy, carbon credits, environment
7. Gaming & Esports
8. Digital Commerce & Trade
9. Agriculture technologies
10. Education and workforce technologies

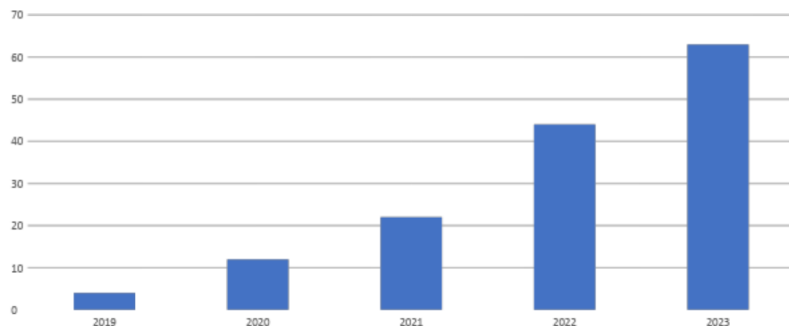


# Showcase Digital Innovation

## Kina Bank

1. Growth in digital revenue from **PGK4m in 2019** to over **PGK60m in 2023**.
2. Average annual growth rate of **100% in digital**, compared with traditional banking services at about 10% .
3. **Cheaper** e.g. Pei Beta can be used by customers of any bank to pay their bills or for mobile phone top ups, and is fee free for the retail customer, while a small fee on the merchant side.
4. Taken the bank to the digital world where **customers already are**
5. Only bank in the Pacific with **WhatsApp Banking**.
6. **Digital kiosks in branches** – take your digital services to where your customers already are.

Kina Bank's digital growth





# Key Questions



- How does PNG create more high-impact, tech jobs?
- How does PNG create – and keep – tech scale-ups in our local economy?
- How can PNG attract the best startups and scale-ups?
- How can PNG partner with legacy industries (Oil&Gas, Tourism, Fintech, Commerce) to develop new technologies at scale?
- How PNG accelerate innovation and build a digital economy?

# Contact Me



**Dr. Jane Thomason**

 janeathomason

 drjanethomason

 [www.drjanethomason.net](http://www.drjanethomason.net)

 [Jane.blockchainquantumimpact@gmail.com](mailto:Jane.blockchainquantumimpact@gmail.com)

