

NIQS NATIONAL WORKSHOP 2024**DRIVING ECONOMIC SUSTAINABILITY AND GROWTH IN
CONSTRUCTION THROUGH A COST-BASED KNOWLEDGE
ECONOMY**

Presented by

QS Dr Fatima Muhammad Bello, MNIQS

At the Nigerian Institute of Quantity Surveyors (NIQS) National Workshop,
Held at M & M Event Centre, Abuja 0n 22nd to 23rd of August 2024

**OUTLINE****Introduction and Definition of Key terms****Cost-Based Knowledge Economy****Economic Sustainability & Growth****Challenges and Strategies****Conclusion**

INTRODUCTION

- ❑ The **construction industry** plays a **vital role in economic development**.
 - In general, it contributes around **7-10%** to the **GDP** of developing nations
- ❑ Despite this, it faces unique challenges such as **managing rising costs, implementing sustainable practices, and staying competitive**
- ❑ These challenges make it imperative to adopt effective strategies that combine cost control with knowledge and innovation
 - ❑ **This will enhance efficiency, reduce waste, and drive sustainable growth**

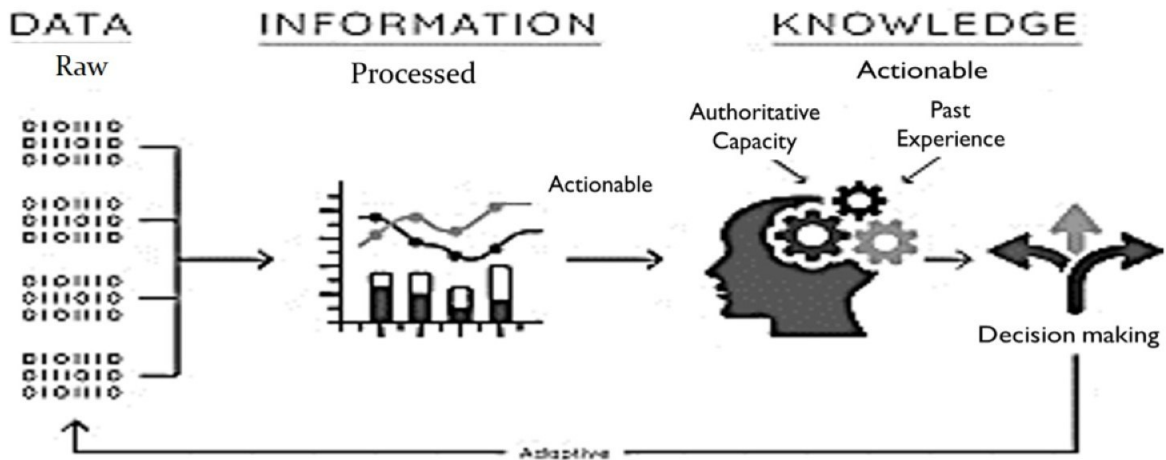
INTRODUCTION: RECAP...

Data

Information

Knowledge

INTRODUCTION: RECAP...



IMPORTANCE OF DATA-DRIVEN DECISION-MAKING

Improved Decision-Making:

- **Data-Driven Insights:** Use data analytics to gain insights into project performance, resource utilization, and risk management, leading to more informed decision-making.
- **Real-Time Monitoring:** Implement real-time data collection and analysis to monitor project progress, allowing for quick adjustments and proactive problem-solving.

Risk Management:

- **Predictive Analytics:** Use predictive analytics to forecast potential risks and challenges, enabling better risk mitigation strategies and reducing the likelihood of delays or cost overruns.
- **Scenario Planning:** Develop data-driven scenarios to assess the impact of different variables (e.g., changes in material costs, weather conditions) on project outcomes.

DEFINITION OF TERMS

Economic sustainability is the practice of **supporting long-term economic growth** by **maintaining the balance** between resource consumption and resource replenishment as well as social considerations.



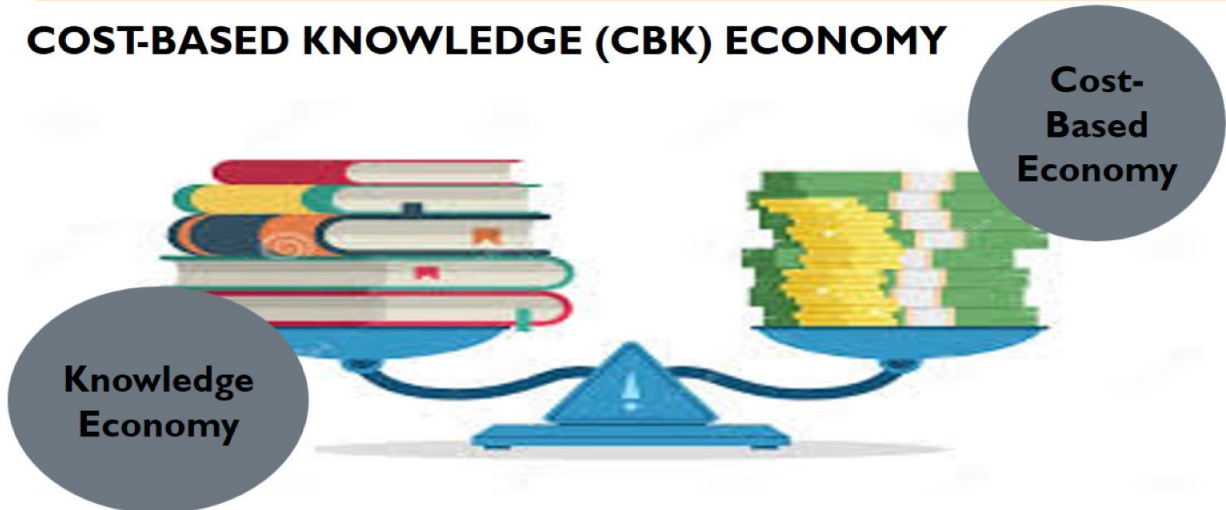
DEFINITION OF TERMS

Economic growth refers to the **increase in a country's production of goods and services over time**, typically measured by the rise in gross domestic product (GDP).



DEFINITION OF TERMS

COST-BASED KNOWLEDGE (CBK) ECONOMY



DEFINITION OF TERMS

- ❑ A **cost-based economy** is an economic system or approach where **the focus** is on **managing, reducing, and optimising costs** to drive growth, competitiveness and sustainability



DEFINITION OF TERMS

- ❑ A knowledge economy can be defined as an **economic system** where the **generation, dissemination, and utilization of knowledge** play central roles in driving productivity, innovation, and economic growth.



COST-BASED KNOWLEDGE ECONOMY

- ❑ A CBK economy **integrates efficient cost management** with the strategic use of **knowledge and intellectual assets** to drive economic growth and sustainability



KEY COMPONENTS OF A CBK ECONOMY



Cost Efficiency



Knowledge Management
(KM)



Innovation

KEY COMPONENTS OF A CBK ECONOMY

Focuses on **minimizing costs** while maintaining or **improving quality** through:

- Resource Optimization
- Budget Control
- Value Engineering

Cost Efficiency



**KEY COMPONENTS OF A
CBK ECONOMY****Resource Optimisation**

- Efficient use of resources (e.g., materials, labor, technology) to **avoid waste and reduce costs** through innovative principles such as lean, prefabrication, modular construction, recycling etc

Cost Efficiency**KEY COMPONENTS OF A
CBK ECONOMY****Budget Control**

- Implementing **effective budgeting practices** to **monitor** and **control expenditures** using methodologies such as earned Value analysis

Cost Efficiency

**KEY COMPONENTS OF A
CBK ECONOMY****Value Engineering**

- Analysing functions of products and processes to **improve value** by either **reducing cost** or **improving performance**.

Cost Efficiency**KEY COMPONENTS OF A
CBK ECONOMY**

Capturing and utilising **valuable insights and expertise** to improve decision-making and operational efficiency through:

- Knowledge Creation
- Knowledge Sharing
- Knowledge Utilisation

**Knowledge
Management**

**KEY COMPONENTS OF A
CBK ECONOMY**

Knowledge Creation

❑ Developing new insights and expertise through **research, experience and collaboration.**

Knowledge Management

**KEY COMPONENTS OF A
CBK ECONOMY**

Knowledge Sharing

❑ Facilitating the **exchange of knowledge and best practices** within and across organisations.

Knowledge Management



**KEY COMPONENTS OF A
CBK ECONOMY**

Knowledge Utilisation

- Applying knowledge to **improve processes, solve problems, and drive innovation.**

Knowledge Management

**KEY COMPONENTS OF A
CBK ECONOMY**

Application of new ideas to drive improvements and create value leading to **cost-effective solutions** and **enhance competitive advantage** through:

- ❑ Technological Advancements
- ❑ Process Improvement
- ❑ Creative Problem-Solving

Innovation



**KEY COMPONENTS OF A
CBK ECONOMY**

Technological Advancements

- **Adopting and integrating new technologies** to improve efficiency and reduce costs.

Innovation

**KEY COMPONENTS OF A
CBK ECONOMY**

Process Improvement

- Continuously **refining processes and practices** to enhance performance and reduce waste with emerging methodologies.

Innovation



KEY COMPONENTS OF A CBK ECONOMY

Creative Problem-Solving

- Using **innovative approaches** to **overcome challenges** and **capture new opportunities**

Innovation



THE RELATIONSHIP BETWEEN KM AND COST EFFICIENCY

KM as a Driver of Cost Efficiency

- Streamlined Operations
- Cost Reduction

Continuous Improvement

- Feedback loop
- Lessons Learned

Knowledge-Based Decision Support

- Data-Driven Decisions
- Predictive Analytics

THE RELATIONSHIP BETWEEN KM AND COST EFFICIENCY

KM as a Driver of Cost Efficiency

Streamlined Operations

Effective knowledge management helps **identify and implement best** practices, reducing inefficiencies and operational costs.

Cost Reduction

By **leveraging knowledge to optimize processes and resource use**, organisations can lower costs and enhance profitability.

THE RELATIONSHIP BETWEEN KM AND COST EFFICIENCY

Continuous Improvement

Feedback loop

Knowledge management creates a feedback loop where **insights gained from previous projects inform future practices**, leading to ongoing improvements in cost efficiency

Lessons Learned

Documenting and sharing lessons learned from past projects **helps prevent repeated mistakes** and fosters more cost-effective approaches.

THE RELATIONSHIP BETWEEN KM AND COST EFFICIENCY

Knowledge-Based Decision Support

Data-Driven Decisions

Access to **accurate and relevant knowledge** supports **data-driven decision-making**, which can lead to more precise cost estimates and better budget management.

Predictive Analytics

Utilising knowledge and data to **forecast trends** and **potential issues** **enables proactive measures** that can prevent cost overruns and inefficiencies.

ECONOMIC SUSTAINABILITY IN CONSTRUCTION

Economic sustainability in construction refers to **the ability of construction projects and the broader construction industry to support long-term economic growth, stability, and prosperity** while minimising negative environmental and social impacts.



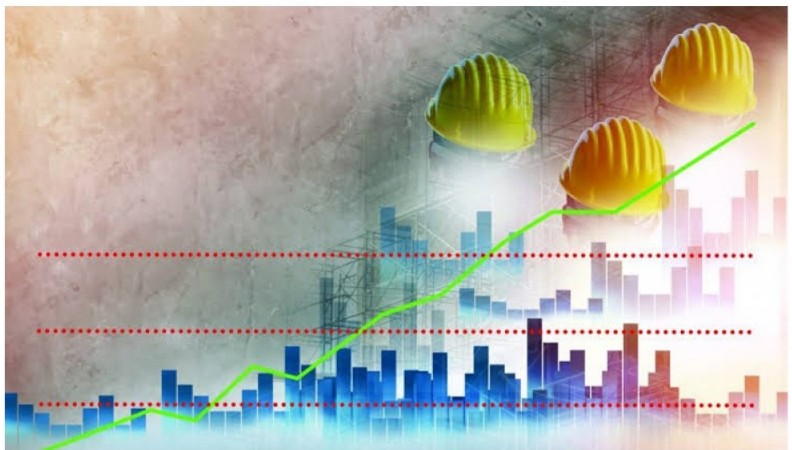
ECONOMIC SUSTAINABILITY

Sustainability

- ❑ **Resource Management:** Efficient use of natural resources, such as water, minerals, and energy, to avoid depletion and ensure availability for future generations. This can be achieved through the use of renewable resources and reducing reliance on non-renewable resources.
- ❑ **Environmental Stewardship:** Integrating environmental considerations into economic planning to minimize pollution, waste, and ecological damage.
- ❑ **Social Equity:** Ensuring that economic benefits are distributed fairly across society, reducing inequalities and providing opportunities for all members of the community.
- ❑ **Long-Term Planning:** Implementing policies that focus on long-term economic stability rather than short-term gains.

ECONOMIC GROWTH IN CONSTRUCTION

Growth in construction focuses on **expanding capabilities** and **outputs** in a way that is efficient and beneficial.



ECONOMIC GROWTH

Growth

- ❑ **Creating jobs:** Growth in the number of workers and improvements in their skills and education contribute to increased economic output.
- ❑ **Market Expansion:** Investment in infrastructure, machinery, and technology that enhances productivity and efficiency.
- ❑ **Innovation and Technology:** This drives productivity gains, creating new industries and improving efficiency in existing ones
- ❑ **Supportive policies:** Supportive policies such as tax incentives, trade agreements, and regulatory frameworks that encourage investment and innovation

ECONOMIC GROWTH

Strategies for Improving Productivity in Construction Projects

- ❑ **Lean Construction Techniques:**
 - **Implementing Lean Principles:** Adopt lean construction methods to minimize waste, improve workflow, and increase value for clients. This includes techniques like Last Planner System, pull planning, and continuous improvement (Kaizen).
 - **Standardization and Modularization:** Use standardized processes and modular construction techniques to reduce variability, improve quality, and speed up project timelines.

ECONOMIC GROWTH

Strategies for Improving Productivity in Construction Projects

□ Effective Project Management:

- **Integrated Project Delivery (IPD):** Encourage collaboration among stakeholders through IPD, where all parties share risks and rewards, leading to better coordination and productivity.
- **Agile Project Management:** Apply agile methodologies to manage complex projects, allowing for flexibility, faster response to changes, and continuous improvement.

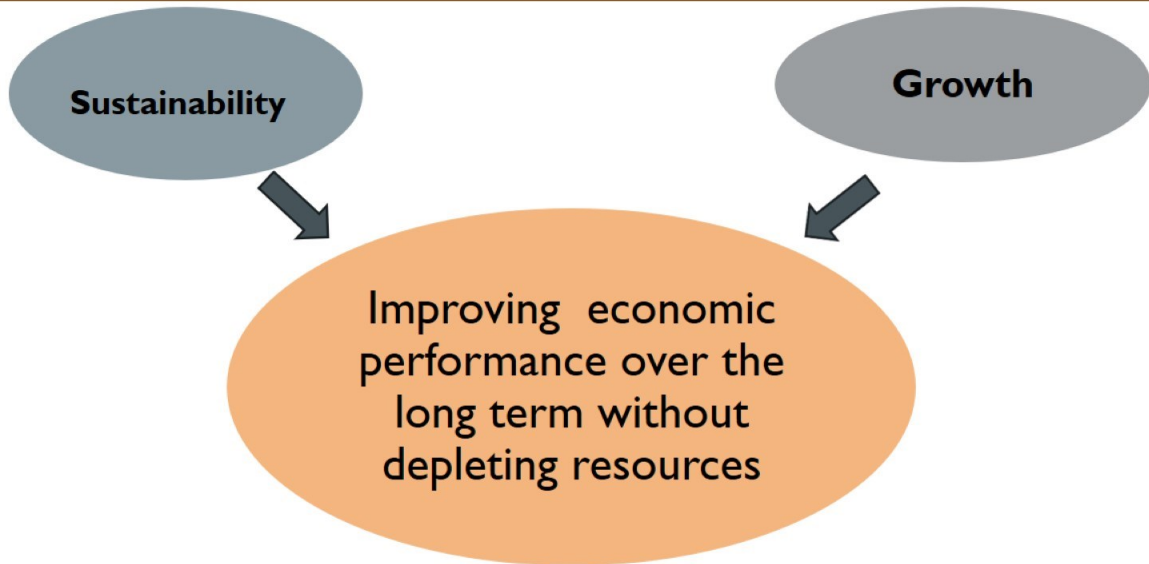
ECONOMIC GROWTH

Strategies for Improving Productivity in Construction Projects

□ Technology Integration:

- **Automation and Robotics:** Incorporate automation in repetitive tasks such as bricklaying or concrete pouring to increase efficiency and reduce human error.
- **Drones and Aerial Imaging:** Use drones for site surveys, progress monitoring, and inspection, saving time and improving accuracy in data collection.

ECONOMIC SUSTAINABILITY AND GROWTH NEXUS



BENEFITS OF A ROBUST COST-BASED KNOWLEDGE ECONOMY

**Improved
Efficiency and
Productivity**

**Stimulated
Investment and
Infrastructure
Development**

**Job Creation and
Economic
Opportunities**

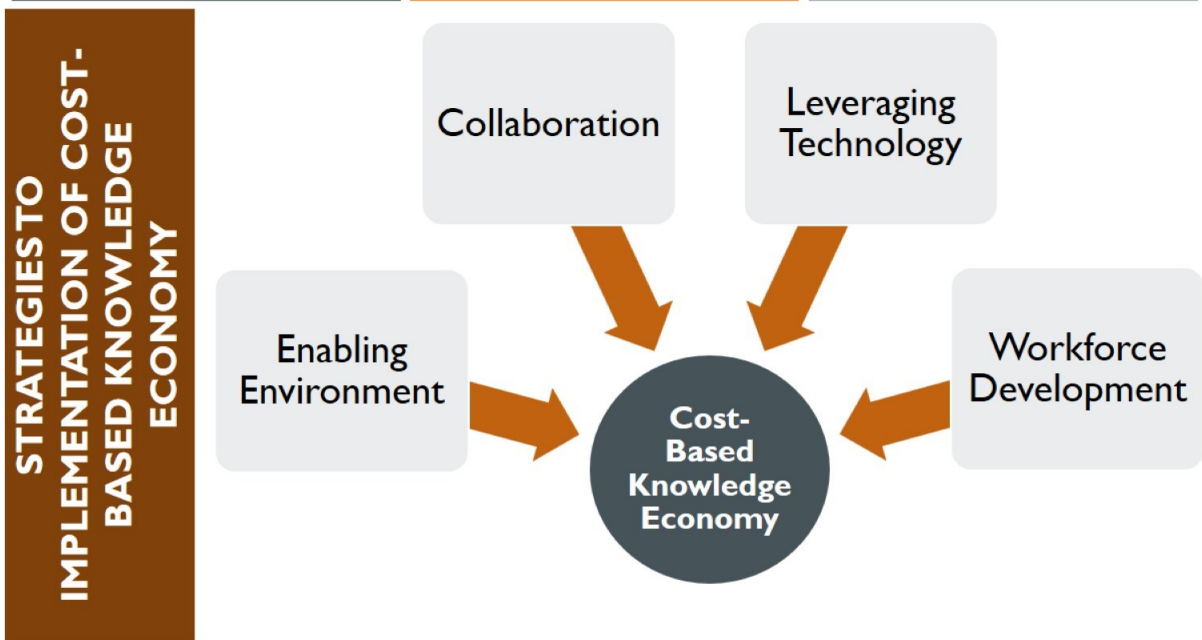
**Technology
Adoption and
Innovation**

CHALLENGES INFLUENCED BY NIGERIA'S ECONOMY

Labor Shortages	High initial cost	Limited Data Access	Resistance to Change
<ul style="list-style-type: none"> ▪ Youth Un-employment ▪ Migration 	<ul style="list-style-type: none"> ▪ Upfront cost ▪ Initial take-off 	<ul style="list-style-type: none"> ▪ Siloed Data ▪ Data Hoarding 	<ul style="list-style-type: none"> ▪ Slow Adoption ▪ Infrastructure Deficit

CHALLENGES INFLUENCED BY NIGERIA'S ECONOMY

- ❑ **Lack of Skilled Labor:** A shortage of skilled labor can limit the ability to implement advanced construction techniques and technologies, impacting overall project efficiency.
- ❑ **High Initial Costs of Sustainable Practices:** The upfront investment required for sustainable construction practices, such as green building technologies, can be a barrier, particularly for smaller projects.
- ❑ **Limited Access to Knowledge and Data:** Construction projects often suffer from siloed information, where valuable knowledge and data are not effectively shared across teams.
- ❑ **Resistance to Change:** Traditional practices in the construction industry can create resistance to adopting new technologies or methods, hindering economic sustainability.



STRATEGIES TO IMPLEMENTATION OF COST-BASED KNOWLEDGE ECONOMY

Enabling Environment

<p><u>Supportive Government Policies</u></p> <p>Supportive policies such as tax incentives, trade agreements, and regulatory frameworks that encourage investment and innovation</p>	<p><u>Focus on Digital Infrastructure</u></p> <p>High speed internet and cloud services are crucial. This will facilitate remote working, virtual collaboration and access to global knowledge</p>
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

STRATEGIES TO
IMPLEMENTATION OF COST-
BASED KNOWLEDGE
ECONOMY

Collaboration

Communication

Foster **open communication and collaboration** among project stakeholders, including clients, contractors, suppliers, and regulatory bodies.

Assign Roles

Establish clear roles, responsibilities, and expectations to align project objectives with financial constraints.

STRATEGIES TO
IMPLEMENTATION OF COST-
BASED KNOWLEDGE
ECONOMY

Leveraging Technology

Adopt Scalable Technologies

Start with scalable, cost-effective technologies that can be gradually integrated into projects. For example, begin with simple project management tools and progressively incorporate more advanced systems like BIM.

Continuous Improvement

Use **data analytics to continuously monitor and improve** project processes, ensuring that efficiency gains are sustained over time.

STRATEGIES TO
IMPLEMENTATION OF COST-
BASED KNOWLEDGE
ECONOMY

Workforce Development

Skill Development Programs

Regularly invest in training programs that focus on both **technical skills and soft skills**, such as leadership and communication.

Knowledge Sharing Platforms

Create platforms where employees can **share knowledge and experiences**, helping to spread best practices across the organization.

CASE STUDY: EKO ATLANTIC CITY, LAGOS

Project Overview:

- Eko Atlantic City is a **massive land reclamation and urban development project** designed to provide a new financial hub for West Africa.



CASE STUDY: EKO ATLANTIC CITY, LAGOS

□ Cost-Based Knowledge Principles Utilised

Cost Efficiency

- Land reclamation providing valuable real estate
- Designed to minimise maintenance cost

Sustainability and Innovation

- Use of energy-efficient materials and systems.
- Designed to be resilient to rising sea levels

Knowledge Sharing

- Interdisciplinary & international Collaboration
- Centralised Knowledge repository

CASE STUDY: EKO ATLANTIC CITY, LAGOS

Cost-Based Knowledge Principles Utilised

- **Cost Efficiency:** The project utilized advanced engineering techniques, including the Dutch expertise in land reclamation, which helped in controlling costs associated with such a massive undertaking.
- **Sustainability and Innovation:** Eko Atlantic incorporates sustainable building practices, including the use of energy-efficient materials and systems. The project is also designed to be resilient to rising sea levels, which was a critical aspect of cost management and long-term sustainability.
- **Knowledge Sharing:** The project involved collaboration between Nigerian engineers and international experts, facilitating the transfer of knowledge and technology, which helped to optimize construction methods and reduce costs.

CASE STUDY: EKO ATLANTIC CITY, LAGOS

Outcome:

- ❑ The Eko Atlantic City project has achieved significant progress in land reclamation, infrastructure development, investment attraction and economic impact.

Challenges:

- ❑ Environmental & social concerns
- ❑ Financial Sustainability
- ❑ Infrastructure Development

CASE STUDY: EKO ATLANTIC CITY, LAGOS

Challenges:

- **Environmental Concerns:** The reclamation of land from the Atlantic Ocean raised concerns about the potential environmental impact, including erosion and disruption to marine ecosystems. Managing these environmental risks added complexity and cost to the project.
- **Financial Sustainability:** Funding such a massive project requires significant investment, and there have been concerns about whether the returns on investment will meet expectations, particularly in the face of fluctuating real estate markets.
- **Infrastructure Development:** The success of Eko Atlantic depends on the development of supporting infrastructure, such as roads, utilities, and public services. Delays or shortcomings in these areas could impact the overall viability of the project.

CASE STUDY: EKO ATLANTIC CITY, LAGOS

Solutions:

- **Environmental Management:** The developers implemented a comprehensive environmental management plan, including the construction of a sea wall (the Great Wall of Lagos) to protect the reclaimed land from ocean surges. Environmental impact assessments were conducted to mitigate potential risks.
- **Attracting Investment:** To address financial sustainability, the project actively sought foreign and domestic investors by showcasing the long-term potential of Eko Atlantic as a new commercial hub. Strategic partnerships were formed with private investors, and incentives were offered to attract businesses and residents.
- **Phased Development:** Infrastructure development was approached in phases to ensure that essential services and amenities were available as the city grew. This phased approach allowed for adjustments based on demand and available resources, reducing the financial burden on the project.

CALL TO ACTION FOR QUANTITY SURVEYORS

**Embrace
Technological
Advancements**

**Enhance Skills
and Expertise**

**Promote
Sustainable
Practices**

**Drive Innovation
and Efficiency**

**Collaborate
and
Communicate
Effectively**

CALL TO ACTION FOR QUANTITY SURVEYORS:

- **Embrace Technological Advancements:** Stay abreast of emerging technologies and tools in cost estimation, such as AI, BIM, and data analytics. Advocate for their adoption within your organizations to enhance accuracy, efficiency, and competitiveness.
- **Enhance Skills and Expertise:** Continuously develop your skills in data analysis, risk management, and technological proficiency. Participate in training programs, certifications, and industry workshops to stay ahead of industry trends.
- **Promote Sustainable Practices:** Advocate for sustainable construction practices within your projects. Encourage the use of green building standards, energy-efficient designs, and materials that minimize environmental impact.

CALL TO ACTION FOR QUANTITY SURVEYORS:

- **Drive Innovation and Efficiency:** Challenge traditional approaches to cost estimation and management by leveraging advanced methodologies and tools. Explore opportunities to streamline processes, reduce waste, and optimize resource allocation.
- **Collaborate and Communicate Effectively:** Foster collaboration among project stakeholders, including clients, contractors, and suppliers. Clear communication of cost expectations, project goals, and risk assessments improves transparency and decision-making.

CONCLUSION

- ❑ The adoption of a robust CBK economy represents a **strategic pathway** for the construction industry **to achieve economic sustainability and growth.**
 - ❑ leveraging **expertise and data available** to drive an **informed cost-effective decision.**
- ❑ Therefore **the CBK model should be embraced** for an economically sustainable, innovative and knowledge driven industry.

Thank You!

