

# ICORCE 2018

**How the Government Can Leverage the Fourth Industrial Revolution in Managing Construction Projects**

Kelvin Wachira Wamaita

NATIONAL CONSTRUCTION AUTHORITY, KENYA



# Construction matters to the world....



Construction-related spending  
accounts for  
**13%** of the world's GDP

More than **100** million  
people employed  
worldwide

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Single largest global  
**consumer** of  
Resources and Raw  
materials

Construction  
contributes to  
**7%** of Kenya's GDP

# A long record of poor productivity



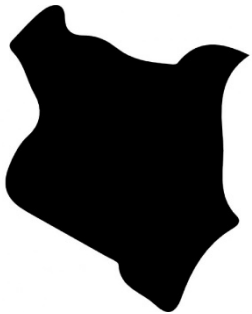
Annual productivity growth has only increased **1%** over the past 20 years.



Construction projects take **20%** more time and are **80%** over set budgets



Only **20%** of projects (from inception) reach financial closure and move to execution.



**48%** of projects reported a cost overrun and **87%** reported a time overrun

# The Government's role...

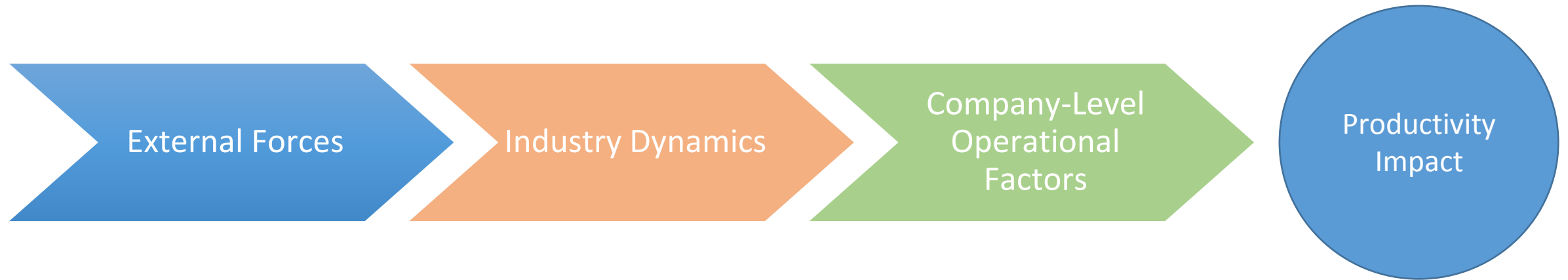
Governments are the  
Largest Developers on  
the continent

57-90% of  
tracked projects

But 83.3% are  
delayed.



# Ten Root Causes



- Increasing project and site complexities.
- Extensive regulation, land fragmentation, and the cyclical nature of public investment.
- Informality and potential for corruption distort the market.

- Construction is opaque and highly fragmented.
- Contract structures and incentives are misaligned.
- Bespoke or suboptimal owner requirements.

- Design processes and investments are inadequate.
- Poor project management and execution basics
- Insufficiently skilled labour at frontline and supervisory level.
- Industry underinvests in digitization , innovation, and capital.

# **Project successes**

# Suez canal corridor area project



## Innovation

- Public funding \$8.5 Billion was raised in 6 days.(Interest bonds at 12%)
- Top priority by the Government.
- Military was utilized



## Impact

- Completed in one year(1/3 of estimated time)
- Increased capacity,49-97 ships per day by 2023.
- Wait times reduced.

# Growth and Transformation plan(GTP II): 44 public universities by 2021



## Innovation

- Use of external consultants(Deutsche gessellschaft fur internationale zusammenarbeit)
- Pre-fabricated components
- State of the art technology



## Impact

- 13 New universities in 5 years
- 48% cost reduction
- Four-fold increase in Ethiopia's student teaching capacity



# Lake Turkana wind power plant



## Innovation

- Use of drone aerial unmanned aircraft(drones) instead of humans/helicopters.
- 1000 workers in 24 hour shifts



## Impact

- Completed in 7 months record deadline(February-August)
- Billions of shillings saved in fines.
- 310 MW added to the grid

**Can the BIG FOUR agenda be successfully executed through the normal and usual approach?**



# Seven Key Areas: The Productivity Opportunity



Great Policies



Innovative collaboration and contracting



Design & Engineering



On-site execution



Education/skills development



Technology

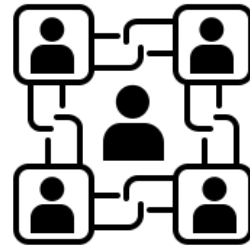
# 4IR Technology: Low hanging fruit?

Big Data



- Leveraging Big Data and AI to make insightful decisions.
- National database of construction activities.

BlockChain



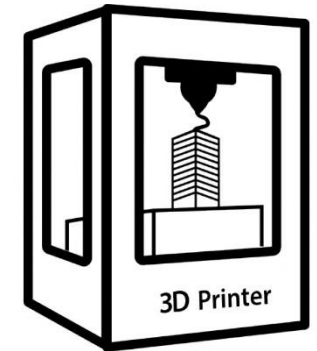
- Smart Contracts
- Procurement and Supply chains

IOT



- Surveying
- Project Monitoring

3D Printing



- Manufacturing style production.

**Thank You!**