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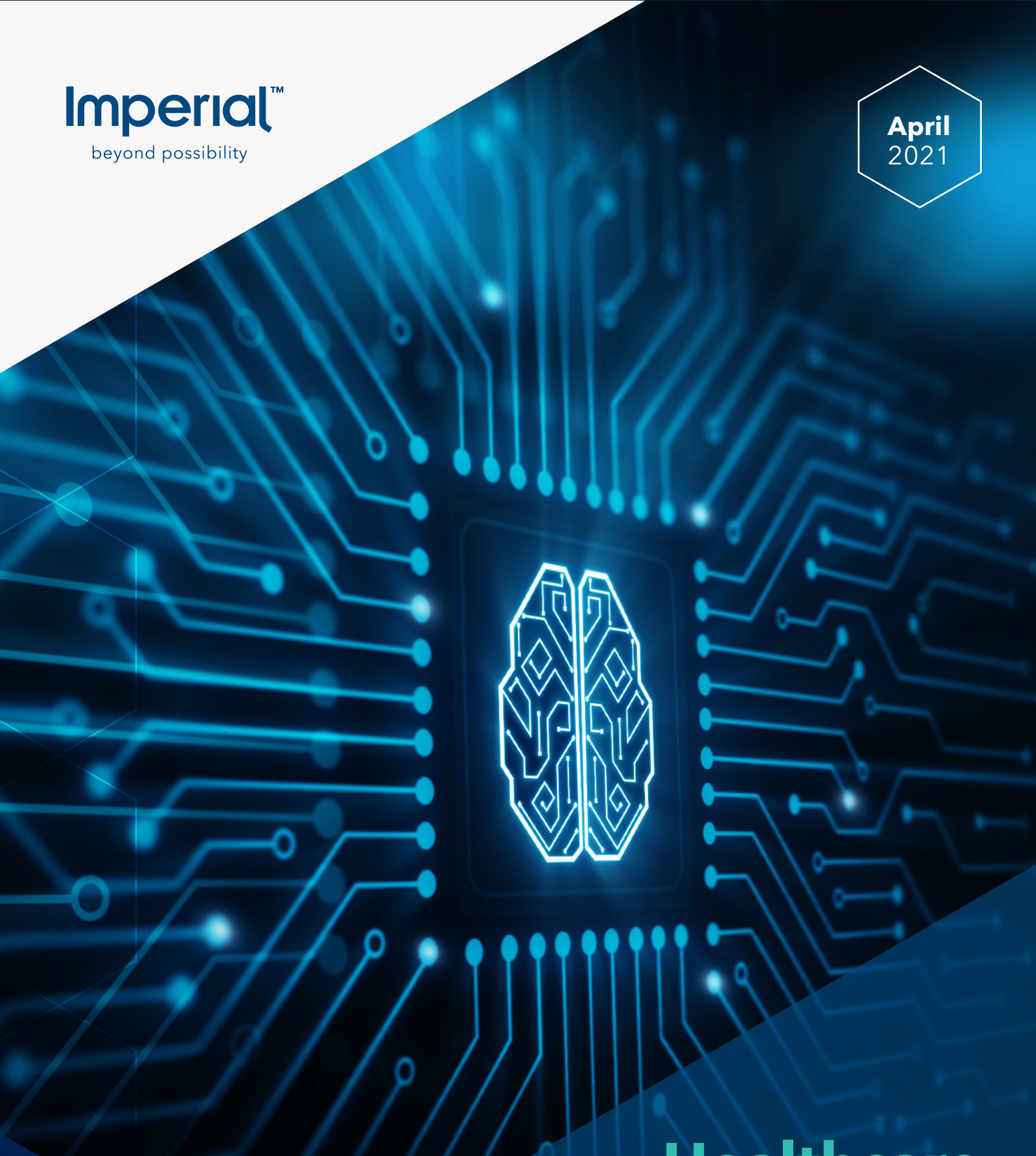

Healthcare Control Towers:

The advancement of cloud-based, real-time technology in healthcare supply chains in Africa

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About Imperial:

Imperial is an African focused provider of integrated market access and logistics solutions, with a focus on the following key industries – healthcare, consumer, automotive, chemicals, industrial and commodities.

Imperial takes its clients and principals' products to some of the fastest growing and most challenging markets in the world.

Ranked among the top 30 global logistics providers and listed on the JSE in South Africa, Imperial seeks out and leverages new technology to deliver innovative, end-to-end solutions.

Through its significant African footprint and international expertise, and with the support of its 25 000 people, Imperial's purpose is connecting Africa and the world – and improving people's lives with access to quality products and services.

A major focus for Imperial in the healthcare industry in Africa is improving the quality and reliability of the supply chain. Updating the way in which the industry works with network trading partners and upgrading its processes will enable healthcare providers to leverage innovations in supply chain management, such as supply chain control towers.

As a leading supplier of healthcare control towers in Africa, Imperial is well positioned to help the industry benefit from the advances that a control tower brings, both in terms of supply chain resilience and improved patient care.

Healthcare Control Towers

– the advancement of cloud-based, real-time technology in healthcare supply chains in Africa

Healthcare in Africa is complex, with various challenges facing those charged with service delivery. Access remains the primary challenge, with currently less than 50% of people on the African continent able to access modern health facilities[1].

The World Health Organization (WHO) lists three major contributing factors to the state of health in Africa – health services, health system performance and health system investments[2]. In addition to access, the challenges that exist in these areas encompass a multitude of factors, including infrastructure, investment, staffing, skills, security, counterfeit products, politics, education and awareness[3].

An increasing emphasis is being placed on the role that technology can play in helping address these challenges[4]. According to the World Economic Forum (WEF), Africa is best positioned to take advantage of the digital revolution in healthcare, using technology to help address the rising burden of disease, as well as infrastructure and environmental challenges[5]. When medical resources are limited, digital technology has the potential to direct these resources to where they are most needed.

Aside from conducting research, developing centres of excellence, regulatory reform and strategic investments, the WEF notes that new technologies can help solve supply chain challenges, improve logistical efficiency and eliminate the barriers that prevent medicines from reaching remote, underserved populations[6].

These technologies include the use of mobile phones, drones, big data, telemedicine and supply chain control towers. A supply chain control tower provides the ability to track and manage demand, orders, inventory, and shipments in real time as products flow through healthcare networks and across international borders[7].

[1] Stanford Graduate School of Business

[2] WHO State of Health in the African Region 2018

[3] World Economic Forum on Africa

[4] World Economic Forum on Africa

[5] World Economic Forum on Africa

[6] World Economic Forum on Africa

[7] One Network Enterprises

A supply chain control tower is built on the foundations of end-to-end visibility, process orchestration and deep analytical capability.

Introduction to Supply Chain Control Towers

Control towers are not a new concept in the supply chain domain. Supply chain academics, thought-leaders, executives and experts have long been promoting the benefits of coordinated control, planning and execution of supply chain activities across all supply chain partners.

A theoretical dream for many years – the advancement of cloud-based, real-time technology – has now enabled the maturation of the traditional paper-based Logistics Management Information System (LMIS) to the modern-day electronic LMIS (eLMIS). Some of these eLMIS' are aligned to the control tower philosophy, which also embodies the Visibility and Analytics Network (VAN) goals popularised by the Bill and Melinda Gates Foundation. For this reason, the names eLMIS, VAN and Supply Chain Control Tower are often used interchangeably.

A supply chain control tower is built on the foundations of end-to-end visibility, process orchestration and deep analytical capability, and is focused on making the supply chain better for the benefit of all. Key measures of success include availability of supply, cost-effectiveness, supply chain agility and the ability to make informed decisions based on real-time supply and demand.

The 2020 Control Tower Technology Value Matrix published by Nucleus Research notes that "the market for control towers has begun to adjust to this need for end-to-end visibility by expanding the scope of their functionalities to take on additional operating responsibilities and drive increased value for customers"[8].

To ensure product quality, supply chain managers require a system that enables them to track unit-level items, spot problems, find an optimised solution, communicate action plans and orchestrate a response, using the insights gained from the information the system provides. Business network technology enables this, and business network platforms such as One Network – indicated by Nucleus Research as the leading global control tower[9] in terms of both usability and functionality – enable full traceability for every item from start to finish, providing visibility across final products, intermediates, and raw materials in real time from their source, across trading partners and to the end consumer.

To successfully represent the complete network of supply chain participants (warehouses, plants, distribution centres, carriers, logistics service providers, customers, contract manufacturers, and suppliers), a supply chain control tower serves as a system of engagement, integrating and harmonising data across internal and external players. It also operates with the capability to embrace many systems and to assume control of any point in the shipment execution lifecycle as needed, even serving to replace legacy or redundant systems. By integrating transaction information across all parties, this solution enables real time visibility of the entire logistics lifecycle from purchase order to shipment order, shipment execution and track and trace, to financial settlement.

[8] Nucleus Research

[9] Nucleus Research

Supply Chain Control Towers for Healthcare

One Network Enterprises notes that a healthcare network control tower provides "comprehensive multi-party end-to-end visibility, plan-to-actual tracking, alerting, automated problem mitigation, AI automated decision-making and KPI visualisation. It enables supply responsiveness to doctor-driven product preferences with continuous adaptation to local hospital department polices, behaviors and goals, with sensitivity to each individual patient's unique situation - with inputs from surrounding medical professions"[10].

Agility and aligning resources to meet demand are key to combating disruptions and exploiting new technologies in healthcare, but many healthcare leaders do not have a strategy in place to achieve this. Challenges include the cost of supply chain complexity and single company-focused IT solutions; over- or under-procurement of stock; increased costs of medical supplies, equipment and labour; and time spent managing supplies and other supply chain tasks[11].

For healthcare providers, the benefits of implementing a healthcare network control tower include reducing inventory stockouts and write-offs to near zero; reducing network-wide inventory; improving logistics utilisation; automating hospital, dispensary, distributor and supplier supply chain processes; and reducing IT costs and complexities due to factors such as electronic data interchange (EDI) proliferation[12].

Another important benefit is improving the integrity of the supply chain, ensuring that authentic products are managed through validated channels, thereby reducing risk for patients.

Adaptive hospital department and doctor-specific supply policies also offer improved patient outcomes, with access to medicines for patients improved by reducing stock-outs and improving flexibility of supply. Healthcare supply chains become patient-driven, with enhanced visibility meaning better preparation for patient visits, reduced waiting time and streamlined access to services[13].

OpenLMIS was the first open source LMIS for medical supply chains designed specifically to meet the requirements of low-income countries. The OpenLMIS community, repository and software are the result of a collaborative process from multiple stakeholders working together to create an innovative eLMIS that fulfills the needs of multiple countries[14]. The aim of the initiative is to improve supply chain efficacy in low resource communities to ensure that people, no matter where they live, have access to essential medicines and supplies when they need them[15].

Agility and aligning resources to meet demand are key to combating disruptions and exploiting new technologies in healthcare.

Another software initiative that aims to strengthen supply chain management in Africa is Field Supply, a Field Intelligence initiative. This unique Control-Tower-as-a-Service for large-scale health programmes connects logistics data with external systems such as healthcare management information systems, so that health programmes and supply chain managers have access to the analytics they need to make informed decisions[16]. It also performs forecasting and supply/logistics planning, as well as digitises

[10] One Network; [11] One Network; [12] One Network; [13] One Network; [14] OpenLMIS; [15] OpenLMIS; [16] Field Supply

the implementation, to ensure healthcare workers are supported and managers have visibility of the periphery of the supply chain.

This service even offers offline functionality, where sites can work offline and still share data when they are able to connect and sync to the network[17]. Additionally, Field Supply's Software-as-a-Service (SaaS) solution under a Service Level Agreement (SLA) means that governments and programmes can launch instantly and affordably, outsourcing back-end operations to focus on healthcare delivery, and gaining access to the Field technical support team needed to scale, maintain and adapt.

Imperial's Integrated Commercial Solutions offering provides multi-national pharmaceutical companies with the opportunity to use healthcare control towers to achieve supply chain benefits through simplifying activities and responsibilities across African networks. Aside from acting as a gateway to Africa for these companies, the benefits include increased patient access, a simplified business model, improved return on investment for principals, and regulatory, ethical and quality compliance.

Global Focus on Healthcare

The United Nations' Sustainable Development Goals (SDGs) are global development goals set in 2015 as part of the 2030 Agenda for Sustainable Development, and as an extension to the more narrowly focused Millennium Development Goals. Adopted by all UN member states, these goals hope to end poverty, protect the planet and ensure that all people enjoy peace and prosperity by 2030[18].

One of the 17 SDGs is 'Good Health and Well-Being', and it is closely linked to the African Union's Agenda 2063 key transformational outcome of 'Improvements in Living Standards', which highlights the need for the reduction of malnutrition and maternal, child and neo-natal deaths, halving the deaths attributable to malaria and HIV/AIDS and increasing access to safe drinking water and sanitation. While only one of the SDGs explicitly references healthcare, over 50 of the 169 targets associated with reaching all goals have an influence or impact on the attainment of good health and well-being for Africa[19].

[17] Field Supply; [18] United Nations Development Program Sustainable Development Goals; [19] WHO State of Health in the African Region 2018

An Integrated LMIS for the Ghana Ministry of Health

The Ghana Ministry of Health (MoH) is responsible for providing public health services, managing Ghana's healthcare industry, and building Ghana's hospitals and medical education system. It seeks to improve the health status of all people living in Ghana, thereby contributing to the government's vision of Universal Health Coverage and a healthy population.

The MoH was faced with a number of challenges:

- Manual ordering processes with high lead-times
- Lack of end-to-end visibility led to poor quality data with which to make decisions regarding selection and availability of medicine
- Stockouts and expiry of health products led to wastage and high costs

As a solution to these challenges, the MoH embarked on the implementation of the Ghana Integrated Logistics Management Information System (GhiLMIS) project, with support from development and implementation partners, including Imperial. This project is ongoing and aims to improve the supply chain for commodities in Ghana especially in the areas of an LMIS that will allow end-to-end visibility throughout the entire supply chain.

The implementation of the GhiLMIS facilitates the integration of the supply chain processes with other business functions and aligns logistics business process to other information systems, resulting in the delivery of the highest quality products and services at reduced cost, with increased responsiveness to customer needs.

One of the most significant project challenges was that data gathering was an enormous task in an environment that was not previously systematised.
Furthermore, rollout to an extensive set of facilities and a large user base was required.

The One Network solution implemented by Imperial included the following features:

- GhiLMIS provides supply chain collaboration and visibility to all the participants and stakeholders of the Ghana MOH and Ghana Health Services (GHS) medicine distribution network.
- GhiLMIS provides decision makers with accurate, timely and appropriate data from planning to execution.

GhiLMIS provides health commodity logistics data and ordering functionalities to enhance users' ability to apply information from GhiLMIS to improve forecasting, budgeting, procurement, inventory control, storage, distribution and reporting from health facility level to central level.

The GhiLMIS has provided increased management efficiencies, in that a single system enables users to efficiently manage multiple supply, demand and logistics transactions; agility level is improved by being more flexible and responsive to meet the changing supply chain requirements; and the GhiLMIS provides proactive alerting and notification of important supply chain events.

The use of GhiLMIS also eliminates redundant data entry and improves quality of data integrity, providing harmonised data and centralised data management. Further benefits include lower inventory operation costs; a reduction in cycle time, reduction in counterfeit stock, level of effort and stock-outs; national transportation rating and visibility; and enterprise-wide batch inventory control and expiry management.

At the end of December 2019, a total of 300 sites including health facilities, supply chain management entities, public health commodity management warehouses at both the national and regional levels have successfully been trained, on-boarded, and certified as GhiLMIS operating ready sites[20].

In FOC, all the Health Centres across the country will be on-boarded in order to transition their manual processing in the supply chain to an automated process.
The implementation over a 10-month period will include training end users, preparing and configuring facility data and users and on-boarding users and sites.

Expected completion is June 2021.

The GhiLMIS implementation project has successfully completed the inception, elaboration and construction phases and is now moving into transitioning the system to the end users. The transition will be over three incremental phases: Central Tier Go Live, Initial Operating Capability (IOC) and the Full Operating Capability (FOC)[21].

Central Tier Go Live and IOC have been successfully completed, with FOC implementation next.

[20] GhiLMIS
[21] GhiLMIS

Conclusion

The healthcare industry in Africa has already benefited from many technological advancements in recent years.

Updating the way in which the industry works with network trading partners and upgrading its processes will enable healthcare providers to leverage innovations in supply chain management, such as supply chain control towers.

This will allow the industry to maximise quality of care, build resilience to patient fluctuations and supply partner issues, as well as improve efficiencies, at every location and in every moment in time, throughout the entire system[22].

For more information on Healthcare Control Towers:

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[22] One Network Enterprises

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