

Industry Transformation: Advanced Manufacturing and Digitalisation of Supply Chain-Logistics

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INTRODUCTION

In the last few years lacklustre Global Economic Growth and sluggish Global & Regional Trade have adversely affected Singapore's economic growth. The Covid-19 pandemic severely exacerbated the shock to the Global economy. Global and Regional Trade and related Supply chains experienced un-precedented disruptions. International Airports and Ports almost came to a standstill as the worlds international airline fleets were grounded and maritime shipping disrupted and stalled.

As a Global Air Hub, Container Shipping & Transshipment Mega Port and Regional Logistics Node in Asia Pacific, Singapore's Trade dependent economy plunged into unprecedented negative economic growth. Lives and Livelihoods were adversely affected impinging on almost all sectors of the local economy save for essential services. Unemployment and Job losses spiked as enterprises, especially SMEs, struggled with Business Continuity to stay afloat.

Government's effective Business Continuity support and pandemic-related crisis management, effective socio-economic policy measures, and Job Support Schemes, underpinned by multiple Crisis Budgets, helped to stabilise the crisis situation. The pandemic exposed major supply chain vulnerabilities affecting the Manufacturing, Industrial Logistics, Commercial sectors as well as Food Security challenges. Supply Chain Resilience became an instant Buzz word amongst Policy makers and Industry.

ADVANCED MANUFACTURING AND DIGITALISATION OF BUSINESSES AND INDUSTRY

2.1 With Government's strong exhortations and encouragement, the pandemic obliged many business sectors and SMEs to innovate and accelerate their respective Transformation Road Maps particularly digitizing and digitalisation of their business models.

2.2 Looking beyond Covid 19, Government made bold Longer term, new Strategic Growth plans to future proof and increase the Competitiveness of Singapore's economy. The Vision is to propel Singapore's future Economy and Industrial base leveraging on Higher Technology, Higher Automation and Artificial Intelligence as well as Data driven Advanced Analytics. Singapore, in so doing, would be positioned into a Global Innovative and Knowledge-intensive Centre with enterprises competing at an advanced Digitalisation playing field.

2.3 Under the Supervision of Jurong Town Corporation (JTC), A New Industry 4.0 Transformation and Advanced Manufacturing ecosystem at the JURONG INNOVATION DISTRICT (JDD) is shaping up. JTC will also oversee another Industrial Infrastructure at the PUNGGOL DIGITAL DISTRICT (PDD) which will be progressively developed into a Smart Business district with specialists ICT—Info—Communications and Technology as well as a Digitalisation talent ecosystem. An ambitious Agri Food Innovation Park (AFIP) is under development at the Sungei Kadut ECO-DIS-TRICT for exploiting Agri-Food Technology and to encourage growth in High-Tech Farming.

2.4 Government's commitment to Environmental Sustainability include plans for a "Circular Economy" where waste materials are repurposed are reused or recycled as useful resources. Clean Energy plans are already actively pursued vis SOLARLAND and SOLARROOF for solar installation and power generation as part of the national effort to strengthen Singapore's Industrial Base and Competitiveness.

3. SHIPPING, TRADE CONNECTIVITY AND SUPPLY CHAIN DIGITALISATION

3.1 The Global pandemic related disruption of International and Regional Trade and Supply Chains required Government and Enterprises to respond with Businesses Continuity and Crisis Management plans while balancing Public health, provision of Essential services and buttressing Food Supplies and Food Security. Both Public and Private sectors were able to progressively innovate and respond using Digital technologies to restore Local supply chain integrity especially relating to critical Food, Medical and Pharmaceutical supplies.

3.2 Shipping is very much a Global Industry supporting over 80% of Global Trade, and Singapore Port is one of the world's Busiest Mega Transshipment Ports. MPA, PSA and the local Maritime Industry rose to the Colossal challenge to keep the Singapore PORTs open to International Trade & Shipping despite massive White Sailings, Schedule Disruptions Acute Container Shortages, Port Terminal Congestion and Maritime Crew Shortages.

3.3 The shipping and supply chain crisis underscored the critical importance of Trade Connectivity and Supply Chain Resilience. Digitalising shipping thus would create enormous opportunities for Singapore to further enhance International and Regional Trade. Enterprise Singapore had successfully launched Trade and Connectivity Challenge 2020(TCC2020) calling for Innovation Collaboration and Solutions to enhance supply chain traceability by standardising processes and system integration for Industry sectors and Enterprise-specific tracks.

3.4 Digitalisation of Government and all Trade & Industry sectors are unequivocally a national imperative for Singapore. MPA, as Regulator, has embarked upon an ambitious DIGITALPORT@SG Plan to strengthen the digitalisation of ALL Port Processes including Port Terminal and Marine Support Services that would improve Port Clearances and reduce Container Shipping turnaround times. Digitalisation is thus an excellent way for Singapore to strengthen its Strategic Trade, Maritime Shipping and Global Connectivity Hub pre-eminence.

3.5 PSA, as Port and Terminal Operator, has also embarked on advanced Supply Chain digitalisation efforts in order to create a new Integrated Network Supply Chain Ecosystem. PSA has developed and upgraded CALISTA, a Digital Platform that will seamlessly integrate Physical Cargo Flows, Regulatory Trade-related Information Flows as well as Financial Flows.

4. TRANSFORMATION OF SUPPLY CHAIN & LOGISTICS VIA DIGITALISATION

4.1 Many industries and large enterprises, and a few SMEs are pursuing incipient and limited digitalisation plans. Most businesses are still adapting to the ongoing Pandemic lest 2nd or 3rd Wave Virus mutations trigger yet another round of local or regional supply chain and trade disruptions.

4.2 For the post-Covid, New Normal, Digitalisation of Businesses and Supply Chains will require strong and unequivocal Commitment from Top and Middle Management. Digital Transformation Road Maps and Phased Implementation are a must. Legacy Linear and "siloesd" Supply Chains and legacy IT Systems need to be upgraded if not jettisoned.

With digital supply chains, traditional silos will eventually dissolve while visibility, real time traceability with new kind of upstream and downstream supply networks will emerge. Only Digital Supply chains will ensure Supply Chain Resilience and Responsiveness to real time, dynamic and demand driven orchestration.