Jebel Ali Port: Container Terminal 3 (T3)

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The road to transformation is paved with technology, innovation and human enterprise. Transformation is no longer an alien word for the marine terminal industry, and for a global player like DP World it is a process that began 36 years ago when the world’s largest man-made harbour emerged from the sands of Jebel Ali.

It was a technological feat unmatched then and admired since, setting new benchmarks as a container port and a commercial gateway for a region stretching from the Indian subcontinent to East Africa, the Middle East and Central Asia. The business model created by Jebel Ali as an integrated port and logistics hub is being replicated today across DP World’s global portfolio, and emulated elsewhere by emerging economies.

For Dubai’s port planners investing in the most sophisticated technology available was never an option. In 1972, seven years before Jebel Ali, Port Rashid launched Dubai’s ambitious ports business as the region’s most modern container terminal facility. Before 2015 ends, Jebel Ali’s Terminal 3 (T3) will be completed and showcased as one of the most sophisticated container terminals on the planet.

A new dawn
T3, is a mammoth 4 million TEU, semi-automated terminal spread over 720,000 square metres that towers over the port’s landscape. It has been built on an old general cargo and there were more than a few heavy hearts when it was decided to demolish the iconic old Control Tower as part of the development.

T3 is an automated container terminal that uses parallel stacking to the quay, fully automated ARMG’s, as well as internal transfer vehicles (ITV’s) for horizontal transport for container transfer from quay to stack and stack to quay. The yard’s stack capacity is 103,764 TEU – designed for the mega-ships. With a draft of 17 metres and quay length of 1,862 meters, T3 can berth 10 ULCS simultaneously, a first for the region.

Automation
Automation scripts every move in the T3 facility which is equipped with 19 SPP (super post-Panamax) gantry cranes, 50 Automated RMG and RTGs, seven empty box handlers, two reach stackers, 190 tractors and 178 trailers. With so much automation, DP World chose CyberLogitec’s OPUS Terminal as its TOS to run Terminal 3, a solution Jebel Ali already uses for Terminal 2, with its 29 SSTS and 60 RMG cranes.

The TOS accounts for a small portion of the total investment in a terminal but it holds the key to operational efficiency. With the latest J2EE-based open architecture, OPUS Terminal delivers high flexibility and scalability, and enables terminals to focus their efforts on increasing efficiency in yard operation, while integrating other terminal operation processes.

As a container terminal operator, DP World’s biggest concerns are increasing efficiency and the visibility of operations, while minimising problems. Unexpected conditions crop up at the quayside, in the yards, at the gates and on the roads that connect its operational locations. Trivial mistakes, if not attended to immediately, stack up to costly operational hurdles in a terminal’s chain of commands. As the saying goes; a chain is only as strong as its weakest link.

OPUS enables Jebel Ali’s staff to focus on analysing KPI data related to overall productivity, the movement of containers, and operational efficiency at large, while the TOS takes care of the automated machinery.

In the vast yards T3 dozens of ITV’s scurry around picking up container boxes, dropping them off at assigned spots and searching around for more. These automated machines are the foot soldiers of major ports in DP World’s global portfolio. Preprogrammed and carefully monitored, they collectively represent artificial intelligence (AI) at work, with the computers providing data by the billions.

Big ships, cranes and data
In the 22 years since the world’s first automated container handling facility opened in Rotterdam in 1993, terminal automation has scaled great heights both in terms of the technology and acceptability in an investment-sensitive industry. The shift from man to machine has seen DP World’s technology allocations rise, but the yield is in the form of unprecedented operational efficiencies and economies of scale, resulting in higher productivity and profits.

In the near future, all the equipment within terminals will be communicating through a network and therefore the container flow will be optimised. Yet for DP World, automation is not a choice, but we do not forget that behind every automated operation, however extensive, there is a human hand. Ultimately, it is humans who are in charge.

To handle the ever-increasing number of boxes arriving at Jebel Ali, DP World switched to quad lift quay cranes. Today, the quad lift system is standard in major terminals across our global portfolio. As DP World’s flagship, Jebel Ali has led by example. The growing sophistication at the
quayside is matched by initiatives like gate automation, RFID tracking of containers and trucks, automated stackers and now the latest semi-automatic SPP giants controlled remotely by men and women. Automation has helped Jebel Ali crack the gender ceiling in dock-side operations, alongside better safety to workers and fewer manual errors.

T3’s remotely operated quay cranes and simulated equipment with HD cameras and panoramic views deliver better accuracy of the data that is fed into the port’s sophisticated systems through high bandwidth networking infrastructure. This is monitored by highly trained support staff with a commitment to embrace new technologies that increase system integrity and productivity.

The Dubai-based global marine terminal operator has focused on a set of fundamentals that have helped adapt the design to existing conditions. Over the past decade the advances made in sensor and navigation technology have made it possible to transform the movement of container handling machines at the terminals. Today the unmanned container handling machines are run by computers or are remotely operated from Jebel Ali’s main operations building.

Conclusion
T3 will be the new flagship terminal and the centre of excellence for terminal automation in the DP World portfolio, setting new operational automation precedents once T3 is finally fully live and operational. When this happens the T3 container terminal, with its 19 remotely-controlled quay cranes, will raise Jebel Ali Port’s total annual handling capacity to 19 million TEUs by the end of 2015.

With every mechanised step, every box unit within the port complex tracked, recorded and secured, Jebel Ali’s operators are using Big Data to good use. All our terminal assets such as quay cranes, yard cranes, yard tractors, trucks and even external trucks are under the radar. The virtual terminal is a reality today.

About the author
Mohammed Ali Ahmed is an industry leader in international marine terminal operations and development, logistics and related services. His leadership, insight, vision and operational expertise has strengthened DP World’s culture of service, excellence and innovation. With two decades of port and management experience, Mohammed Ali Ahmed is the Chief Operating Officer for DP World, UAE Region. Under his portfolio comes in addition to the leading Jebel Ali Port, Mina Rashid (port) and Mina Al Hamriya (port) in Dubai and the Fujairah Container Terminal on the United Arab Emirates Indian Ocean coast.

About the organisation
DP World’s flagship facility Jebel Ali Port is strategically located in Dubai. It provides the Middle East region with an integrated multi-modal hub offering sea, air and land connectivity, complemented by extensive logistics facilities. Jebel Ali Port plays a vital role in the UAE economy, and is a premier gateway for over 90 weekly services connecting more than 140 ports worldwide. It has market access to over 2 billion people. Expansions currently underway at the port will bring total handling capacity to 22.1 million TEU by 2018. Jebel Ali is ranked the 9th largest container port worldwide, and recognised as the world’s most productive port in 2014. It has been voted “Best Seaport in the Middle East” for 21 consecutive years. DP World, UAE Region portfolio includes Jebel Ali Port, Mina Rashid Cruise Terminal and Coastal Berth, Mina Al Hamriya in Dubai city and Fujairah Container Terminal.

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