



TALENT MANAGEMENT IN INDUSTRIAL REVOLUTION 4.0 ERA: A CASE OF PORT OF TANJUNG PELEPAS, JOHOR, MALAYSIA

Tomingan Kamaron⁽¹⁾, Razali Yaacob⁽²⁾, Mohammadehsan Torabizadeh⁽³⁾

(1) School of Port, Logistics and Management, Netherlands Maritime Institute of Technology, Johor Bahru, Malaysia, tomingan@nmit.edu.my

(2) School of Port, Logistics and Management, Netherlands Maritime Institute of Technology, Johor Bahru, Malaysia, razaliy@nmit.edu.my

(3) School of Port, Logistics and Management, Netherlands Maritime Institute of Technology, Johor Bahru, Malaysia, ehsan@nmit.com.my

Keywords: Sustainability, Human Resource Development, Talent Management, Hinterland

ABSTRACT: Containers has taken the international trade by storm and pushing globalisation and internationalisation of trade to its height. Today, containerisation continues to become the most preferred choice of transport mode especially for immediate consumer goods. As a result, the importance of containerisation has been recognised and adopted by the world over. Due to this development, UNCTAD has developed Liner Shipping Connectivity Index (LSCI) in 2004 to ascertain countries’ position with respect to global liner shipping network. In 2016, Malaysia ranked 4th behind China, Singapore, and Korea. This can be taken to explain the success of two of the Malaysian ports – Port Klang and Port of Tanjung Pelepas (PTP) to attain the position as the 12th and 18th world largest container port in the world. UNCTAD also offered 7 policy measures to enhance port connectivity which are: Go digital, Link domestic, regional and global networks, ensure competition, port modernisation, widen hinterland, and promote sustainability. PTP being considered as one of the fastest growing ports in the world has since then been pushing boundaries in the quest for building modern and state-of-the-art facilities as well as suitable accompanying manpower to man these facilities. It is a balance to be taken with extreme vigour and synergised with the maritime cluster players. The big contributor is Iskandar Regional Development Authority, which is tasked with developing an immediate hinterland with a land mass of 4,749 square kilometre earmarked for industrial, commercial and export oriented agricultural products. Getting ready with skilful manpower in this age of IR 4.0 is an uphill battle due to 1) the country in general is not geared fully in IR 4.0 2) the youths are still not ready with IR 4.0 demand, and 3) PTP itself is still continually grappling with the problems of staff retention. Developing and managing talent manpower is extremely difficult. PTP is also working closely with Telekom Malaysia (TM), Malaysia’s largest telecommunication company to strengthen its digitisation and digitalisation program. PTP has considered the human resource as the most challenging part in her quest for staying sustainable. This paper will focus on the human resource development for PTP to stay relevant for the future. The seven parameters used as guidelines in the development of the human resources are – automation and optimization, environment sustainability, global trade, port and terminal, shipping lines, smart technology and supply chain.



INTRODUCTION

Port had been instrumental in the growth and expansion of international trade since 7,000 years ago (Archaeological Institute of America, 2013). Seaports are also becoming an important node between sea-leg and land-leg in the whole global supply chain network. According to Poitras, G., Tongzon, J. and Li, H., (1996) seaports are increasingly urged to constantly improve their operational efficiencies as dictated by competitive environment. Van de voorde and Winkelmanns (2002) viewed competition as having three levels -: the first-level is the inter-port competition (national); second, the inter-port competition (regional/international); the third level, the intra-port competition (completely international). As a result of these stiff competition, seaport has to constantly increase its service quality in ensuring sustainability of its operation (Ines K., et al 2011). Therefore, competition in modern port situation does not only affect the quality of the service providers but on a wider aspect, it affects the whole supply chain (Acciaro, 2015).

It is a general believe that the efficiency of the port is at its height when the port is fully integrated within the global supply chain (Mangan, et al, 2016). Consequently, this situation brought the service level to a higher plane where port users are demanding the accompanying value elements from these supply chain. For container terminal, increasing throughput is near impossible without increasing the service quality. With I.R 4.0 and the internet of things (IoT), meeting the customer demand for fast and efficient service cannot be done the usual way. Possibly the way forward as proposed by Maxwell R. M. (2013) is for complete port automation system. Significant changes in port development has brought about profound change in determining the requirement for specialized knowledge, new skills and capabilities, and new approach in training programs. For Port of Tanjung Pelepas (PTP), huge commitment will have to be followed in terms of talent management and in-house training. The education institution at home presently are not able to supply ‘trained’ personnel as per required by PTP in term of highly skilled and competent manpower to manage its operation. PTP has to design its own training programs to create highly skilled and highly competent workforce for its operation and management.

ENABLING ENVIRONMENT

The beginning of PTP

PTP has been considered as South-East Asia fastest transshipment port (NST- Sep 13 2004). It had achieved the 1 million TEUs mark in 571 days. This operational success is contributed due to: 1) its closeness to the main shipping lane, 2) its internal strength which lies on the doorstep of the economic generators (huge hinterland) that promises a sustainable growth for its gateway and transshipment cargo. In other words, this hinterland is a great contributor to cargo volume. These two advantages combined has provided PTP with good connectivity to port around the world. This situation is in line with what UNCTAD has developed in 2004 which is termed as Liner Shipping Connectivity Index (LSCI) the objective of which is to ascertain countries’ position with respect to global liner shipping network. In 2016, Malaysia ranked 4th behind China, Singapore, and Korea. This can be taken to explain two of the Malaysian ports – Port Klang and PTP to attain the position as 12th and 18th world largest container port respectively. UNCTAD also offered 7 policy measures to enhance port connectivity which are: Go digital, Link domestic, regional and global networks, ensure competition,



port modernization, widen hinterland, and promote sustainability. PTP especially is making every effort to stay relevant and its future development in all the areas suggested by UNCTAD will ensure its sustainability. It is important for PTP to check both the internal and external competitions but more so to meet and satisfy the demand of its customers especially within its hinterland. In short, these measures are workable and achievable. Overall, the success of PTP’s development are attributed to:

- i. The planning for the port development had been thought of or envisaged as early as in the 1980s as a result of the study done by the local university (University Malaya) on the future of Johor Port Authority (Othman, A. G. et al. (1982).
- ii. The success of Johor Port Berhad covering all aspect of cargo operation - Johor port later added its container terminal operation as a result of the success of Johor State Industrialization program, which signaled that additional port facilities were needed.
- iii. This success has strengthened the central Government’s (through the Ministry of Transport – MOT) confidence to develop the Iskandar Malaysia (IM) under the concept of Economic Corridors (EC). This land mass is placed under the Iskandar Investment Berhad, but Iskandar Regional Development Authority (IRDA) is tasked to plan, develop, promote and coordinate both public and private sector towards realizing the vision of developing Iskandar Malaysia into a strong and sustainable metropolis of international standing.

The supporting infrastructure – The Economic Corridor (EC - IM)

The Economic Corridor (EC) can be understood as “*an integrated framework of economic development within a designated geographical area, which places trade-related infrastructure at the core, but goes further to encompass interconnected issues of public policy, regulations, and operational practices required for stimulating economic growth and development within the designated area.*” (ADB Economics Working Paper Series - 2017)

The idea of EC was introduced by the Malaysian Government in the Ninth Malaysia Plan 2006 – 2010 with the intention of achieving a balanced growth throughout the country. Five ECs were then developed by the Government in various stages which are:

- i. East Coast Economic Region (ECER) - Located in the East Coast of Peninsular Malaysia covering the state of Kelantan, Terengganu and Pahang as well as the district of Mersing in Johor, covering a total area of 66,000 sq. km. The population stands at 3.9 million or 14.5% of total Malaysian population.
- ii. Northern Corridor Economic Region (NCER) - It encompasses the states of Kedah, Perak, Perlis and Penang, with a coverage of 32,559 sq. km.
- iii. Sabah Development Corridor (SDC) - It is centred in Greater Kota Kinabalu (GKK) and supported by six Strategic Development areas (SADs) to complement GKK.
- iv. The Sarawak Corridor of Renewable Energy (Score) - This is the centre for energy resources, particularly hydropower (28,000 MW), coal (1.46 billion tonnes), and natural gas (40.9 trillion sq. cu ft.) found in the central region.
- v. Iskandar Malaysia (IM) - Started to be developed in 2006 with a landmass of 2,217 sq. km. These areas were earmarked for industrial and commercial development. It received an allocation of RM 6.83 billion from the Central Government. To improve connectivity, the Coastal Highway and the



Eastern Dispersal Link was introduced. To add balance value to the IM projects, two distinct developments were carried out:

- a) Theme parks – LEGOLAND Malaysia Puteri Harbour Family and Sanrio Hello kitty Town
- b) Education Hub called EduCity which houses among others, the Netherlands Maritime Institute of Technology, Newcastle University, The University of Southampton, University of Reading, Multimedia University, and Management Development Institute of Singapore.

Thus far until 2018, IM has recorded a total cumulative investment of RM 221 billion and has created 702,000 jobs in various sectors covering the services sectors such as logistics, creative, tourism and education. As of 2019, Iskandar Malaysia region will be extended from 2,217 sq. km to 4,749 sq. km which will cover industrial, commercial and export-oriented agricultural activities. Roland Berger (2012) in its study on the cargo potential for Johor State industrial development envisaged that the total cargo generated by the state is estimated to be in the region of 1.3 billion tonnes by 2045, which translates to around 60 million TEUs in container volume.

The Iskandar Malaysia Economic Corridor and together with the Johor State industrial Program has provided the needed strength for PTP to excel. The industrial development of Iskandar Malaysia development has now become the immediate hinterland for PTP, providing the ‘gateway’ cargo for itself. It is no wonder PTP is all out to capitalize on the rapid industrial development in ensuring its sustainable future.

TALENT AND HUMAN RESOURCE DEVELOPMENT – PTP EXPERIENCE

The utmost importance for PTP to take concern are 1) technological application and development is fast changing and the need to keep up with it; 2) the accompanying workforce has to have the required skill and competency and to be continuously retrain and upgraded. The success and world position that PTP had attained so far warrants that the development of its human resources be given top priority. For this, PTP has lined up a detailed development program for its workforce as shown in Figure 1. This is a complete ‘Fast Track’ development for its workforce beginning right from its recruiting process. PTP has to undergo such HR development program due to:

- i. It is extremely difficult to retain staff especially once they are trained and gained experienced in port management and operation.
- ii. It is equally difficult to recruit the right staff – right knowledge and competency from the market. More often, staff have to be trained with the port environment and this will take time especially in the operation area. For example, the equipment such as gantry or quay cranes and transtainers are only found in ports.
- iii. To date there are no higher education that have the right modules for port management and operation.

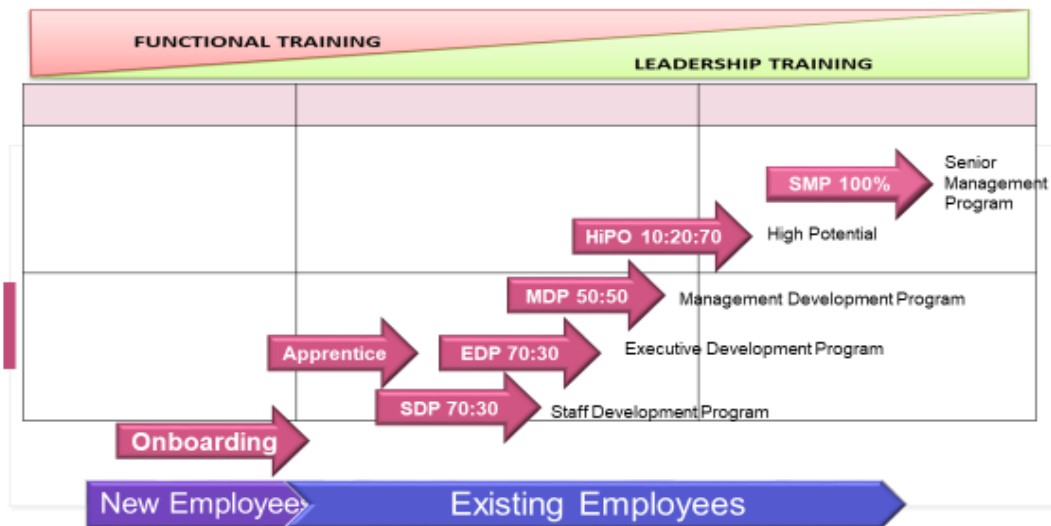


Figure 1: The ‘Fast Track’ Human Development Timeline for PTP

Realizing the issues and challenges faced by PTP with respect to its human resources, PTP had come up with a detail program for human resource development call the ‘Fast Track’ Program. The objective is to design a specific development program for every level of staff and monitoring it on a constant basis while creating a talent pool for the future.

‘Onboarding’

Every staff recruited by PTP must go through the ‘onboarding’ process. This entail the staff to undergo rigorous training on matters such as:

- Port management
- Port operation
- Leadership
- Safety

To work in port, the staff must know the port business. The training will be conducted by the internal trainer and assessment is recorded. This is the first stage where staff are monitored and possibly slotted into the talent pool. To PTP, this stage is crucial. The recruitment process does not only look into the entry qualification but most of all the underlying ‘attitude’. It will be the ‘Attitude’, ‘Knowledge’ and ‘Skill’ in that order. To PTP, staff with the right attitude are easy to train and mould. These are the one that make up the ‘talent pool’ for the succession planning.

Safety aspect is also considered very important for PTP so much so that any staff that is timely for promotion will have their safety knowledge tested and passed the required level.

Apprentice

Under this apprentice scheme, there are two types of training carried out: 1) the POPA and 2) YEAP.

i. The POPA – Port Operations Planning Apprentice Program.

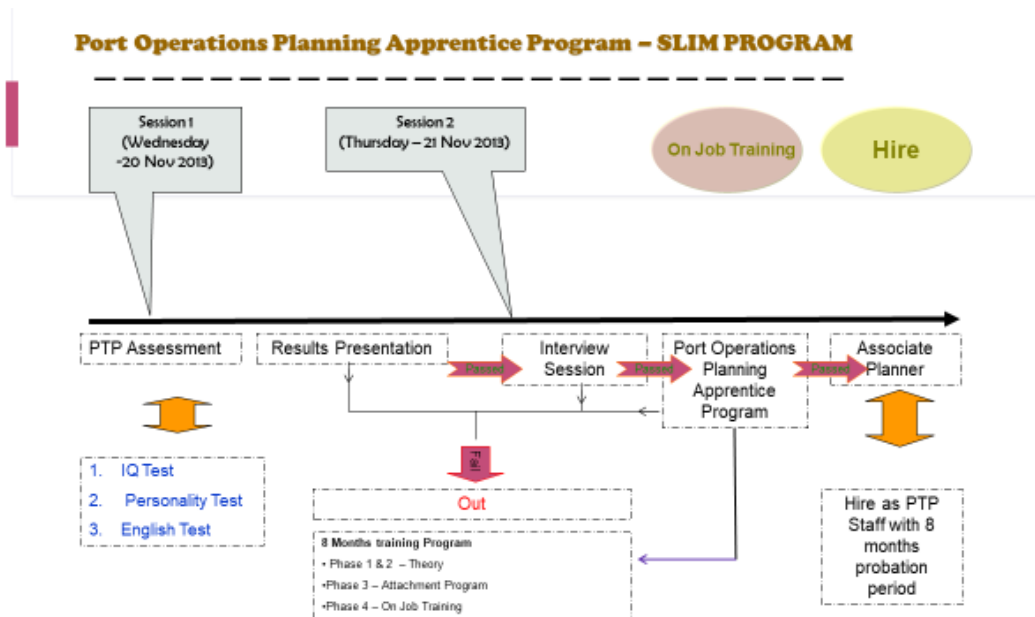


Figure 2: The POPA Program

This POPA program starts with PTP carrying out the assessment on the potential candidates based on: IQ test, Personality test, and English test. Candidates who make the grade will undergo results presentation and finally interview session. Successful candidates will finally undergo the Port Operations Planning Apprentice Program which follow the specific 8 months training program. This is a combined training which include; Phase 1 - covers all aspect of the terminal operation; Phase 2 - on introduction of the terminal operation (computer) system; Phase 3 on attachment Program, where the apprentices are attached to all the units of the operations, and finally; Phase 4 - gives the opportunities for on-the-job training. Once the 8 months training is completed, the candidates will be hired as PTP staffs.

This is one of the earliest training programs. PTP has to continue this program as many of the trained staff left PTP for greener pastures elsewhere especially within the maritime cluster community. For PTP, it is a lost but on the contrary, it is a gain to the industry.

ii. Young Engineering Apprentice Program (YEDP)

This program is tailored for the engineering staff specifically for maintaining the big and specialized equipment such as the gantry or quay cranes, yard cranes or the transtainers, the reach stackers, heavy duty forklifts etc. The engineering training areas cover the following modules.

Training Module Technical Port Equipment Training



Figure 3: The Specialised YEAP

They say ‘port never sleeps’. All the port equipment are operational almost 24 hours. Their maintenance schedule has to be prepared as efficient and effective as possible. To do this, PTP has to have a high technical competent team. There is absolutely no possibility to recruit engineering staff suitable for the port fresh from the market. Most engineering students – electrical or mechanical do not have modules specifically tailored for port equipment during their 4 years of study at the university. To do this, PTP has a collaboration with some of the local universities. PTP will select some of their students to undergo 1-year Technical Port Equipment Training where the training modules are specially designed by PTP covering all its equipment.

Technical Competency – Training Plan

Based on the assessment findings, below are the recommended prioritized training by the Equipment Department :-

Q-Crane Team (Maintenance & Services)	RTG Team (Maintenance & Services)	ME Team (Maintenance & Services)
1. General QC training	1. General RTG training	1. General ME training
2. Mechanical	2. Electrical	2. Hydraulic
3. Hydraulic	3. Mechanical	3. Mechanical
4. Electrical	4. Engine	4. Electrical
	5. Hydraulic	

Figure 4: Areas of Focus under the Technical Training



PTP Carrier Development Program

Every staff are accounted for in term of career development. The objectives of this programs are:

- i. To close the ‘gap’ (‘gap’ analysis to be done) on the current competency level to the required competency level of the position.
- ii. To ensure the target staff are suitable and able to perform with the current position.

PTP is very particular in identifying and closing this ‘gap’ through the gap analysis as this has direct bearing on staff competency, efficiency and productivity.

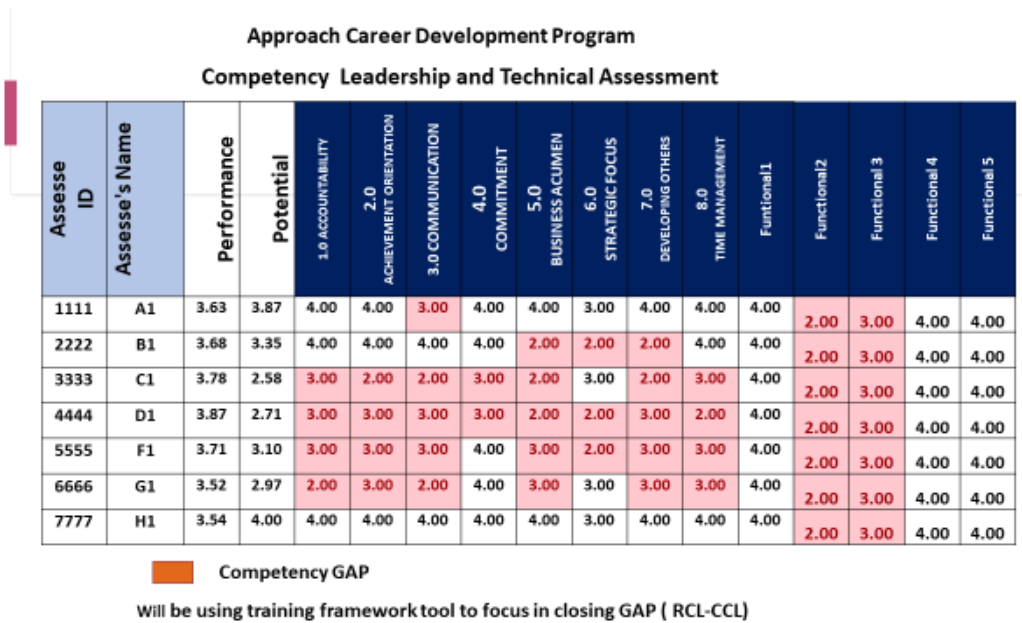


Figure 5: Gap Analysis

Figure 5 shows, a complete assessment on competency as well as technical assessment. The figure too shows 8 areas of competency and 5 areas of technical to be assessed. For example, for manager G1, the red boxes under the competency and technical indicates that there are a lot of ‘gaps’ to be closed that warrants retraining or reskilling.

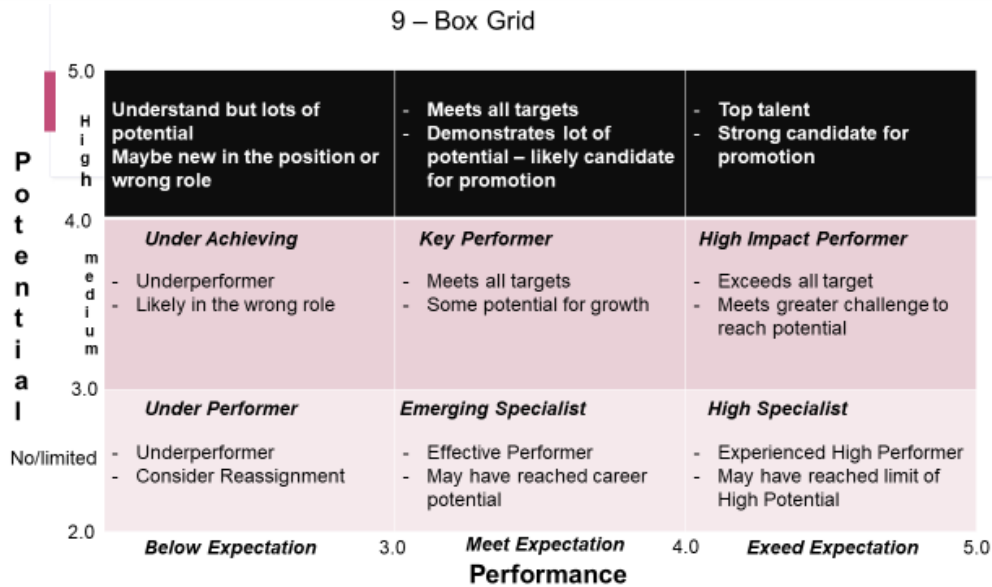


Figure 6: The 9-Box Grid or ‘Performance’/’Potential Matrix

The ‘Potential’ and ‘Performance’ assessment is done using the 9 – Box Grid or the Performance-Potential Matrix (Figure 6). For example, staff having ‘performance’ of 3.52 means that he/she is somewhere in the ‘Emerging Specialist’, while if his/her ‘potential’ is 2.97, he/she falls in the ‘Under Performer’ box, indicating that a lot of training and retraining need to be done for this staff. As it is, he/she is not a candidate for the talent pool.

Competency Framework : Leadership and Functionals

Leadership & Functional Competency & Proficiency Level													
Required Competency for Each Position Level	Accountability	Achievement Orientation	Communication	Commitment	Business Acumen	Strategic Focuc	Developing Others	Time Management	Functional 1	Functional 2	Functional 3	Functional 4	Functional 5
General Manager	5	5	5	5	5	4	5	5	4	4	4	4	4
Manager to Senior Manager	4	4	4	4	4	3	4	4	4	4	4	4	5
Executive to Assistance Manager	3	3	3	3					4	4	4	5	5
Supervisor	2	2	2	2					4	4	4	4	4
Non-Exec									3	3	3	3	3

Figure 7: Competency Framework

This competency framework in Figure 7 is used to identify the training or retraining need. In the initial stage, the Training Need Analysis (TNA) was based on the discussion between the supervisor and staff during the appraisal. Currently, the competency analysis is used as the data resources to identify training need and to develop program to close the ‘Gap’ through training, retraining and upskilling. Basically, the benefits of the competency framework as seen by PTP are:

- i. Increase profitability – a competent workforce will deliver result.
- ii. Create an agile, learning and competent workforce for sustainable growth
- iii. Ability to assess own competency gaps and take action to address the shortcomings.
- iv. Cultivate the right values to get results
- v. Aware of the skills and knowledge required to perform their jobs effectively and have the avenues to acquire them
- vi. Develop a more effective and structured competency based Human Capital System.

Identifying HiPO (High Potentials)

High potential employees are said to be the future leaders of businesses. In the era of fast changing technology, corporations are realizing the importance of HiPO employees. In this respect, HiPO can be defined as someone who is capable of rising to and succeeding at a more senior role or critical position. An employee’s potential can be identified as his/her aspiration, functional ability and engagement. PTP identifies HiPO based on the following areas where, aspiration, engagement and ability merged. In deciding this, PTP needs to understand its employees first in terms of:

- i. The risk that the candidates will fail to achieve a senior position
- ii. The risk that PTP itself are not able to produce the quality of employee who will be effective in the more senior role
- iii. The risk of employees leaving and going to the competitor or joining other organizations.

APS High Potential Model

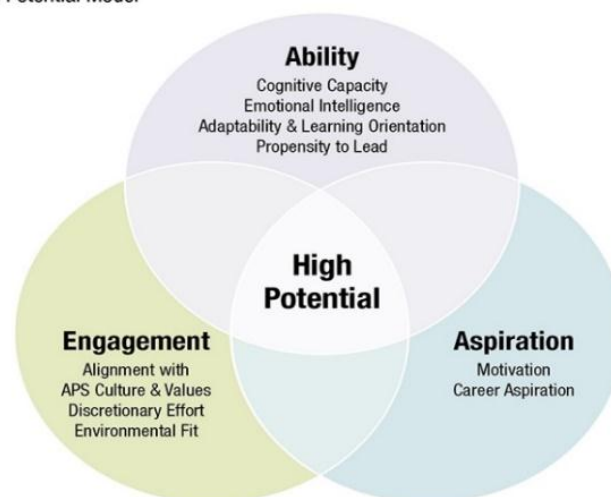


Figure 8: The HiPo Model



The three attributes that will allow the employees to rise and succeed in more senior, critical position are:

- i. Aspiration: to rise to senior roles
- ii. Ability: to be effective in more responsible and senior role
- iii. Engagement: to commit to the organization and remain in challenging roles.

Based on studies, it is understood that 1 out of 7 high performers is HiPO. And for this, PTP has to carry out a proper assessment on these 3 attributes:

- Assess for aspiration and critical career management behaviours to understand if an employee will rise to a senior and more challenging position and turn that motivation into career success.
- Assess for future managerial and leadership ability to know whether the employee has the competences required for success in more senior and challenging roles
- Evaluate engagement to know whether the employee is committed to PTP and sees the PTP as the best place to realize their career.

All the above assessment programs carried out will contribute to finding the suitable employee to be identified as ‘High-Potential’ performers.

PTP talent management

In the final analysis, PTP has to manage all the HiPOs for the sustainability of the port. PTP talent management is based on its understanding that talent management is “*a systematic development process established to identify, attract and develop talent for long term business sustainability and to have sustainable organizational leadership*”. The PTP’s objectives of the talent management program (TMP) is to attract, develop and retain high performers and HiPOs. This TMP covers all level of employees with the main purpose of replacing leaders and employees in the critical positions.

Supporting Soft infrastructure, Computer System and Network

PTP believes that the HRD must be synchronized with the technological advancement that the port is continuously experiencing. Human is the most important asset in this mix, therefore technology and human aspect must be in harmony. It is in this respect that PTP is gearing itself as one of the best equipped and most technologically advance terminal in the region. Moving forward PTP is now upgrading its current Enterprise Resource Planning (ERP) system as one of its digital strategy. PTP is working to enable end-to-end digital transformation through a comprehensive ERP which will cover its Human Capital Management (HCM) functions, such as monitoring trainings, courses, absences, answering queries on leave and holidays, etc. This function will be integrated with PTP’s core operational software under Navis N4 TOS, being the upgraded version of Navis SPARCS.

CONCLUSIONS

PTP is set to stay on course, to be relevant and sustainable in future. For PTP, the most important assets are the employees. It is the employees who chart the future course for the port. It is therefore prudent to invest extensively on the development of its workforce. The human development and the relevant assessment are tailored to identify the HiPOs and charting its talent management.



ACKNOWLEDGMENTS

The authors would like to thank the Netherlands Maritime Institute of Technology (NMIT) for the financial supports.

REFERENCES

1. Acciaro, M. (2015). Corporate responsibility and value creation in the port sector. *International Journal of Logistics Research and Applications*, 18(3), 291 – 311.
2. ADB Economics Working Paper Series – Economic Corridors and Regional Development: The Malaysian Experience. NO 520 December, 2017, presented by Prema-Chandra Athukorala and Suresh Narayanan
3. Alina-Petroneta HALLER. Globalization, Multinational Companies and Emerging Markets. *ECOFORUM* Vol 5, Issue 1 (8), 2016.
4. Containerization International (1970 – 1992). Various issues. London: National Magazine Co. Ltd.
5. Daniel M. Bernhofen, Zouheir El-Sahli, and Richard Kneller. Estimating the effects of Containerization on world trade, School of Economics, University of Nottingham, University Park, Nottingham, NG7 2 RD.UK.
6. G. V. Vijayasri, The importance of International Trade in the World. *International Journal of Marketing, Financial Services & Management Research*, Vol. 2. No. 9, September, 2013. ISSN 2277-3622
7. Hlali A, & Hammami S (2019). The evaluation of Containerization and its impact on the Maghreb ports *Annals of Marine Science* 3(1):001-005. DOI: <http://dx.doi.org/10.17352/ams.000012>.
8. Ines, K., Cedomir D., Alen J. Customer-Based Port Service Quality Model, *Promet – Traffic & Transportation*, Vol. 23, 2011, No. 6, 495-502
9. Levitt T. The Globalization of Markets, *Harvard Business Review*, May/June 1983.
10. Mangan, J., Lalwani, C. L. (2016). *Global Logistics and supply chain management*, John Wiley & Son.
11. Maxwell R. Mozo P.E., “The Future of Container Terminal Automation” (Presentation). CH2M Hill, May 16, 2013.
12. New Strait Times, September, 13, 2004. <http://www.ptp.com.my/media-hub/news/ptp-set-to-attract-more-shipping-lines> (extracted 9th January, 2020 @ 0920 hrs)
13. Othman, A. G. et al. (1982). *Johor Port: An Economic Evaluation & Formulation of a Long-Term Expansion Strategy*. Faculty of Economy and Administration, University of Malaya, Kuala Lumpur 22-11.



10-12 October 2020

-
14. Poitras, G., Tongzon, J., Li. H., 1996, Measuring Port Efficiency: An Application of Data Envelopment Analysis. Department of Economics and Statistics, National University of Singapore, Singapore 0511.
 15. Roland Berger, (2012), Port Development Blueprint for Johor (2014 – 2045)
 16. Rossella Lorenzi, Archaeology Magazine, a Publication of the Archaeological Institute of America, January/February 2014
 17. Reich, R. (1983), The World of Nations, Oxford University Press.
 18. UNCTAD (2016). Review of Maritime Transport. UNITED NATIONS PUBLICATION Sales no. E.16.II.D.7 ISBN 978-92-1-112904-5 eISBN: 978-92-1-058462-3 ISSN 0566-768

ⁱ **Tomingan Kamaron** is senior lecturer at the Netherlands Maritime Institute of Technology (NMIT). He holds an MBA from the University of Hull (UK). He has over 35 years of experience in port industry, having served in various operational and management roles in port authority, port operator and logistics companies.