Research – White Paper

Addressing Human Capital and the Human Element Challenges Faced by Global Maritime Professionals (GMPs) through Triple Helix Collaboration and Digital Transformation through a One-Stop Mobile App

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Objective

The Smart Development Institute (SDI), a certified IRS 501(c)(3) non-profit firm, acts as agents for transformational changes leading to the enablement of Smart Communities to improve the quality of life of the citizens of communities. SDI is a technology partner of an Ocean Titan, the Philippine Transmarine Carriers (PTC) Group, for promoting Blue Ocean initiatives. Our goal is to enable a Smart Maritime Community to support GMPs address current and future human capital and the human element challenges as well as educate and train GMPs to become good stewards of the marine environment.

This paper aims to understand human capital and the human element challenges faced by mariners or Global Maritime Professionals (GMPs). It explores how to leverage Digital Technology and perform Transformational Changes in the maritime industry to foster Triple Helix (public, private, and academic sectors) collaboration, promote Digital Inclusion, and explore the use of a One-Stop Mobile App to act as a centralized hub for information services and support. The overall objective for this initiative and research is to help address existing and evolving human capital and the human element challenges faced by GMPs to improve their Quality of Life as well as their Resiliency.

Understanding Human Capital and the Human Element Challenges of Global Maritime Professionals (GMPs) at Sea

The maritime industry, often romanticized for its adventures on the high seas and highly recognized for its integral role in global trade and economy, is also home to a hidden struggle that seldom makes headlines but is deeply ingrained in the lives of those who call the sea their workplace. This hidden struggle involves human capital and the human element challenges faced by GMPs and it is important to understand these challenges and look for creative ways or intervention programs to address these challenges.

Research – White Paper

Title: **Addressing Human Capital and the Human Element Challenges Faced by Global Maritime Professionals (GMPs) through Triple Helix Collaboration and Digital Transformation through a One-Stop Mobile App**

September 16, 2023   Page 2 of 12

"Human Capital" and the "Human Element," while both terms are related concepts that are often used in the context of business, economics, and management, they refer to different aspects of the workforce and organization. In their simplest terms, Human Capital refers to the skills, knowledge, experience, abilities, and other intangible qualities possessed by individuals within an organization or a society. The Human Element, on the other hand, encompasses a broader set of factors related to the role of people within an organization or system. It includes not only the skills and capabilities of individuals (human capital) but also their behaviors, attitudes, interpersonal relationships, and overall impact on the organization's culture and dynamics.

GMPs face daunting and challenging tasks and are subject to various human capital and the human element challenges that impact their safety, well-being, and the overall success of their voyages. These challenges arise from the nature of the maritime industry, the isolated and demanding environment of the open ocean, and the diverse GMP's who work together on ships. Some of the key challenges include:

1. Crew Fatigue: Long working hours, irregular schedules, and the need for constant vigilance can lead to crew fatigue, which can impair decision-making and reaction times, increasing the risk of accidents.

2. Isolation and Social Isolation: GMPs often spend extended periods at sea away from their families and friends that can lead to loneliness, anxiety, and issues.

3. Stress and Mental Health: The high-pressure environment of maritime work, combined with isolation, can contribute to stress, depression, and other mental health problems among GMP's.

4. Cultural and Language Differences: Crews on ships can be highly diverse, with members from various countries and cultures. Differences in language, customs, and communication styles can lead to misunderstandings and conflicts.

5. Communication Challenges: Limited communication with loved ones and difficulties in accessing medical assistance or emergency services can add to the stress and anxiety experienced by GMPs.

6. Training and Skill Levels: Ensuring that all GMP's have the necessary training and skills to perform their duties safely can be a challenge, especially on ships with multinational crews.

7. Safety Culture: Establishing a strong safety culture on board is crucial, as it can impact GMP's' attitudes towards safety procedures and their willingness to report safety concerns.

Research – White Paper

Title: Addressing Human Capital and the Human Element Challenges Faced by Global Maritime Professionals (GMPs) through Triple Helix Collaboration and Digital Transformation through a One-Stop Mobile App

September 16, 2023   Page 3 of 12

8. Human Error: Human error is a significant factor in maritime accidents. Mistakes in navigation, equipment operation, and decision-making can have serious consequences.

9. Piracy and Security Threats: GMPs may face security threats such as piracy and armed robbery, which can result in physical harm, psychological trauma, and damage to the ship and its cargo.

10. Environmental and Weather Conditions: The unpredictability of weather and sea conditions can add to the stress and challenges of maritime work. GMP's must be prepared to deal with adverse conditions and emergencies.

11. Regulatory Compliance: GMPs must adhere to a complex set of international regulations and standards, which can be challenging to navigate and implement effectively.

12. Long-Term Career Impact: The nature of seafaring often requires GMPs to be away from home for extended periods, which can strain personal relationships and impact their long-term career prospects.

   These human element challenges do not go unnoticed in the maritime industry. Efforts are made within the maritime industry to address these challenges through intervention programs such as improved training, mental health support services, safety protocols, and communication technology. However, many of these intervention programs are fragmented and the unique nature of seafaring continues to present significant human element challenges for GMPs at sea.

Solution:

Promote Triple Helix (Public, Private, and Academic Sectors) Collaboration complemented by Digital Transformation through a One-Stop Mobile App

   The human capital and the human element in the maritime sector are very complex and have multi-dimensional challenges. With so many spectrums of human issues as well as activities performed by different stakeholders, addressing human capital and the human element issues, such as, safety, security, healthcare, career management, ocean environmental protection, disasters, and many more, are daunting tasks and requires effective collaboration of all stakeholders.

Research – White Paper

Title: **Addressing Human Capital and the Human Element Challenges Faced by Global Maritime Professionals (GMPs) through Triple Helix Collaboration and Digital Transformation through a One-Stop Mobile App**

September 16, 2023   Page 4 of 12

Triple Helix Collaboration

One holistic approach to tackle these challenges is from the perspective of the Triple-Helix collaboration, the Public, Private, and Academic Sectors collaborating closely address the many challenges of human capital and the human element faced by GMPs.

1. Research and Education Initiatives:

   a. Academic Sector: Universities can collaborate with the maritime industry to conduct research on human capital challenges, such as workforce development, safety, and crew well-being. They can also develop specialized maritime education and training programs that align with industry needs.

   b. Private Sector: Industry partners can provide input and data to academia to identify the specific skills and competencies required in the maritime sector. They can also offer internships, apprenticeships, and on-the-job training opportunities for students and professionals.

   c. Public Sector: Government agencies can provide funding and regulatory support for the development of advanced training and simulation technologies in the maritime sector. This can include simulators for ship handling, crisis management, and safety drills.

   d. Academic and Private Sectors: Universities and maritime companies can collaborate on research and development projects to create cutting-edge training tools and technologies. These innovations can improve the effectiveness of maritime training programs and enhance the skills of the workforce.

2. Safety and Human Element Research:

   a. Academic Sector: Researchers in academia can investigate human element challenges related to safety in the maritime sector. This may include studies on human factors, fatigue management, mental health, and crew resource management.

   b. Public and Private Sectors: Government agencies and industry stakeholders can collaborate with researchers to implement the findings of these studies into safety regulations, operational procedures, and crew training programs.

3. Workforce Diversity and Inclusion:

Research – White Paper

Title: Addressing Human Capital and the Human Element Challenges Faced by
Global Maritime Professionals (GMPs) through Triple Helix Collaboration
and Digital Transformation through a One-Stop Mobile App

September 16, 2023   Page 5 of 12

a. Public and Private Sectors: Collaboration between government and industry can result in initiatives to promote diversity and inclusion within the maritime workforce. This includes efforts to attract and retain talent from underrepresented groups and fostering a more inclusive workplace culture.

b. Academic Sector: Universities can contribute to these efforts by conducting research on diversity and inclusion best practices and offering training programs on these topics.

4.   International Collaboration:

a. Public Sector: Governments can facilitate international collaboration in the maritime sector by engaging in diplomacy and agreements with other nations. This can help address global human capital challenges, such as the standardization of training and certification requirements for seafarers.

b. Private and Academic Sectors: Maritime companies and academic institutions can participate in international research projects and exchange programs to share best practices and knowledge related to human capital development.

Triple Helix collaboration in the maritime sector can lead to research-driven solutions, innovative training programs, improved safety measures, and a more inclusive workforce. By leveraging the expertise and resources of academia, industry, and government, the maritime sector can better address the complex human capital and human element challenges it faces.

Fostering a Triple Helix collaboration is also a daunting task, and we need a catalyst to promote such synergies between all three sectors. A One-Stop Mobile App, that integrates and consolidates a myriad of public, private, and academic sector services including but not limited to information portals, other websites and/or mobile apps, online services, and workflows designed specifically to service the needs of the GMPs can be a powerful tool to promote Triple Helix collaboration in the maritime sector. It can facilitate communication, information sharing, and coordination among public, private, and academic stakeholders.

Digital Transformation through a One-Stop Mobile App

A One-Stop Mobile App tailored for the maritime industry to support GMPs can be a powerful tool to address the human capital and the human element challenges by providing GMPs with a centralized platform for access to essential information, services, and support. Equally important, it also promotes Digital Inclusion that plays a significant

Research – White Paper

Title: **Addressing Human Capital and the Human Element Challenges Faced by Global Maritime Professionals (GMPs) through Triple Helix Collaboration and Digital Transformation through a One-Stop Mobile App**

September 16, 2023   Page 6 of 12

role in addressing the human capital and the human element challenges faced by GMPs by providing access to technology and communication tools that enhance their well-being, safety, and job performance.

The one-stop mobile app can fulfill the many objectives, including but not limited to:

Objective 1 - Enhanced Communication and Connectivity:

Serves as a centralized platform for GMPs to access communication channels, including voice calls, messaging, and email, allowing them to stay connected with their families, colleagues, and support networks.

Objective 2 - Social Connectivity:

Features social networking elements, such as forums or chat rooms, enabling GMPs to interact, share experiences, and build a sense of community.

Objective 3 - Cultural and Language Exchange:

Facilitates communication and understanding among GMP's from diverse backgrounds through language translation features and cultural awareness content.

Objective 4 - Safety and Emergency Response:

With safety and emergency responses are always a top priority for any industry, notifies GMPs of critical safety alerts, emergency procedures, and contact information for relevant authorities in case of accidents or crises.

Objective 5 - Documentation and Reporting:

Streamlines the documentation and reporting processes, making it easier for GMPs to report safety incidents and equipment maintenance issues. This is also convenient for the GMPs as it is always accessible through their mobile device.

Objective 6 - Regulatory Compliance:

Provides GMPs with easy access to up-to-date regulations, checklists, and compliance resources, helping them adhere to safety protocols.

Objective 7 - Mental Health Support:

Integrates a variety of mental health resources for GMPs. This resource can be tailored to the individual needs of the GMPs and act as a private digital space for them to seek support. Furthermore, GMPs will be able to access resources to help them with stress management and coping strategies for the difficulties they may be going through.

Research – White Paper

Title: **Addressing Human Capital and the Human Element Challenges Faced by Global Maritime Professionals (GMPs) through Triple Helix Collaboration and Digital Transformation through a One-Stop Mobile App**

September 16, 2023   Page 7 of 12

Objective 8 - Health and Wellness:

Offers information on fitness routines, nutrition, and managing health issues at sea, promoting overall well-being.

Objective 9 - Training and Education:

Offers a multitude of training materials, training modules, certifications, and educational resources. This allows GMPs to enhance their certifications and overall education during their off-time at sea.

Objective 10 - Career Development:

Provides information on career advancement, job openings, and training programs, helping GMPs plan their maritime careers effectively.

Smart MoBee – SDI's One-Stop Mobile Application Development Platform

SDI's one-stop mobile app, called Smart MoBee, can help fulfill the objectives discussed above. Smart MoBee is a "no code/low code" mobile application development platform, for creating a one-stop mobile app that will integrate and consolidate a myriad of services, information portals, external URLs and workflows to support the GMPs and well as on shore. Smart MoBee promotes digital inclusion and serves as an effective platform for communication, outreach, and information dissemination as well as for collaboration among all maritime stakeholders.

The following table lays out how the key features of Smart MoBee (SMB) can fulfill the objectives:

Research – White Paper

Title: **Addressing Human Capital and the Human Element Challenges Faced by Global Maritime Professionals (GMPs) through Triple Helix Collaboration and Digital Transformation through a One-Stop Mobile App**

September 16, 2023   Page 8 of 12

SMB Feature	Objective(s) to Fulfill
1. Integration / Consolidation / Aggregation: One of the most powerful features of Smart MoBee is its ability to integrate and aggregate a myriad of public, private, and academic sector services, informational portals, websites, and other mobile apps. The mobile app has all the resources necessary to facilitate communication and understanding among GMP's from diverse backgrounds. For example, the application can be configured to add features for language translation and be customized to have cultural awareness content. This will service the varying needs of GMPs, allowing GMPs to access digital tools, infrastructure, and communication channels.	Objective 1 - Enhanced Communication and Connectivity Objective 2 - Social Connectivity Objective 3 - Cultural and Language Exchange
2. Ping System: Smart MoBee has the Ping System using GIS Mapping Technology to track the whereabouts and conditions of GMPs. Alert notifications will be issued when various thresholds of non-responsiveness or periods of inactivity are reached. These alert notifications will serve as triggers to notify appropriate authorities to consider or undertake appropriate intervention measures to guarantee the safety of the GMPs. This feature will enhance the capability of keeping track of GMPs and proactively assisting them while isolated.	Objective 4 - Safety and Emergency Response

Title: **Addressing Human Capital and the Human Element Challenges Faced by Global Maritime Professionals (GMPs) through Triple Helix Collaboration and Digital Transformation through a One-Stop Mobile App**

September 16, 2023   Page 9 of 12

3. Incident Reporting:

The Smart MoBee Mobile App provides the GMPs with an Incident Reporting capability right on their fingertips. This feature provides the GMPs with the ability to report incidents, such as maltreatment, crime, disaster, emergency, etc.

The incident report will include geolocation services to automatically pinpoint the location of the reporting mariner, automatic time and date stamp of the date the report is being filed, date of incident, allow input of text, pictures, and videos to describe the incidents.

The incident report is then forwarded to a central command where it is processed, documented, and passed on to appropriate parties for resolution.
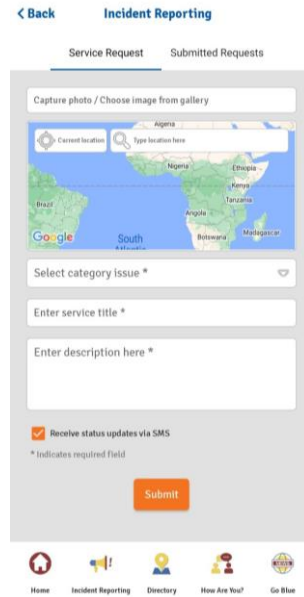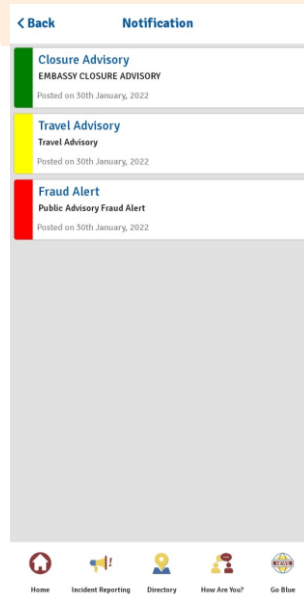
Objective 4 - Safety and Emergency Response

Objective 5 - Documentation and Reporting

4. Alerts & Notifications:

This feature will send just-in-time information, such as maritime issues, travel advisories, and disaster, or if need be, Emergency Broadcast Notifications to all GMPs anytime on a 24/7 basis.

Notifications are color-coded as follows: Green for non-emergency notifications, Yellow for warning notifications, and Red for critical or emergency notifications. These alerts will also be broadcasted as red banners on top of the screen.

Objective 4 - Safety and Emergency Response

Objective 6 - Regulatory Compliance

Research – White Paper

Title: **Addressing Human Capital and the Human Element Challenges Faced by Global Maritime Professionals (GMPs) through Triple Helix Collaboration and Digital Transformation through a One-Stop Mobile App**

September 16, 2023   Page 10 of 12

5. Artificial Intelligence (AI) Integration:

With the labor shortages across many industries, such as healthcare, Smart MoBee has the capability of integrating AI-based programs such as mobile apps and/or portals, that can aid in the intervention programs to service the needs of GMPs.
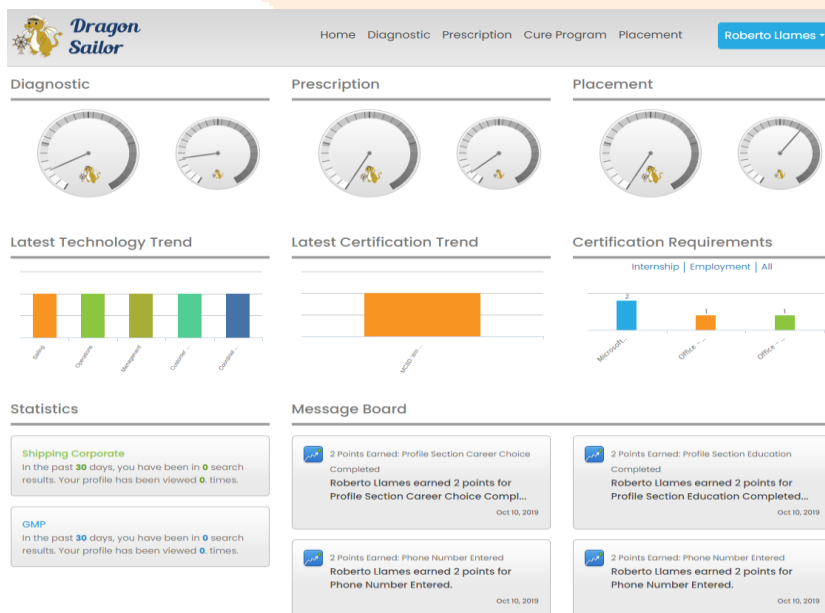
One healthcare area, for example, is Mental Health. For instance, an AI-powered chatbot can be integrated to serve as a personalized wellness assistant, tracking GMPs' physical health data, sleep patterns, and nutrition, offering proactive suggestions to maintain optimal well-being even in the demanding maritime environment.
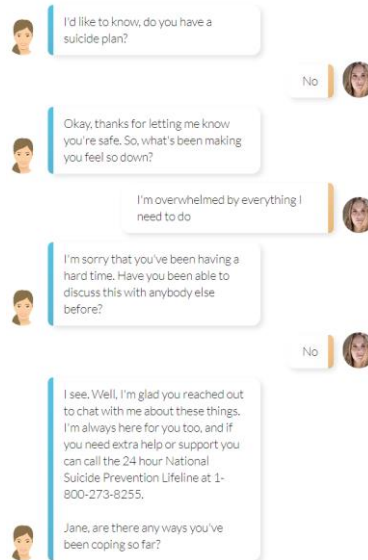
Objective 7 - Mental Health Support

Objective 8 - Health and Wellness

6. Dragon Sailor – SDI's Human Resources Information System (HRIS):

Objective 9 - Training and Education

Objective 10 - Career Development

Research – White Paper

Title: **Addressing Human Capital and the Human Element Challenges Faced by Global Maritime Professionals (GMPs) through Triple Helix Collaboration and Digital Transformation through a One-Stop Mobile App**

September 16, 2023   **Page 11 of 12**

Smart MoBee has a standalone Intelligent Human Capital Supply Chain and Management System or HRIS, called Dragon Sailor, to help GMPs plan their maritime careers effectively. Dragon Sailor incorporates Artificial Intelligence (AI) and Business Intelligence (BI) to service the needs of both the job seekers and employers and bridge the recruitment gap between these stakeholders. The platform helps enhance GMPs' career profile and provides them with on-target job matching results. It also contains a proposed training and certification program aligned to meet GMPs' needs.	

To successfully promote digital inclusion and implement a one-stop mobile app for the maritime industry, it is essential to involve industry stakeholders, including maritime authorities (public sector), shipping companies (private sector), and maritime training institutions (academic sector) – the Triple Helix. By designing a one-stop mobile app that integrates information, services, and support as well as encourages active participation from public, private, and academic sectors, we can promote Triple Helix collaboration in the maritime sector, fostering innovation, knowledge exchange, and problem-solving in this crucial industry.

Furthermore, with the advancements in communication technologies, such as maturity and availability of economical satellite communications, it is now feasible and affordable to do transformational changes to promote digital inclusion and implement a comprehensive one-stop mobile app for the GMPs.

Conclusion:

The human capital and the human element challenges faced by GMPs at sea are both profound and multifaceted, impacting their safety, well-being, and the overall success of their voyages. These challenges range from crew fatigue and isolation to cultural differences, safety concerns, and regulatory complexities, and are intrinsic to the maritime profession. While efforts have been made within the industry to address these challenges through various intervention programs, the need for a comprehensive and digitally inclusive solution has never been more evident.

The concept of a one-stop mobile app tailored for the maritime industry, as exemplified by SDI's Smart MoBee, emerges as a transformative force poised to revolutionize GMPs' lives at sea. Such an app has the potential to enhance communication, promote social connectivity, bridge cultural gaps, bolster safety protocols, streamline reporting processes, ensure regulatory compliance, offer vital

Research – White Paper

Title: Addressing Human Capital and the Human Element Challenges Faced by Global Maritime Professionals (GMPs) through Triple Helix Collaboration and Digital Transformation through a One-Stop Mobile App

September 16, 2023   Page 12 of 12

mental health support, and facilitate career development. By serving as a centralized platform that integrates a wide array of services, information, and resources, it empowers GMPs to navigate the challenges of their profession with newfound resilience and efficiency.

Moreover, the collaboration among maritime authorities, shipping companies, and academic institutions, referred to as the Triple Helix, is crucial for the successful implementation of such digital solutions. With the advent of advanced communication technologies, including accessible satellite communications, the vision of a smart maritime community where GMPs enjoy enhanced quality of life, safety, and well-being is within reach.

In essence, the one-stop mobile app represents not just a technological advancement but a testament to the industry's commitment to its workforce. It signifies a commitment to addressing human capital and the human element challenges GMPs face while fostering digital inclusion. As we look to the future of the maritime sector, this innovation stands as a beacon of hope, promising a brighter, safer, and more connected world for those who brave the seas in the name of global trade and adventure.

Finally, this one-stop-mobile app will not only foster Triple Helix collaboration but can also lead to a Quad-Helix model where the GMPs will act as the 4th valued contributor of the helix – A True Smart Maritime Community.