



Proceeding Paper

# e-Healthy Ship: New Approaches for Improving Health Management on Merchant Vessels <sup>†</sup>

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- † Presented at the Public Health Congress on Maritime Transport and Ports 2022: sailing to the post-COVID-19 era, Athens, Greece, 21–22 October 2022.

Abstract: On Merchant vessels, there is usually no physician on board. Health management there is a great challenge for the responsible nautical officers. To simplify health administration on board diverse electronic health modules including a medical logbook and pharmacy module were developed in cooperation with an IT company. These modules are integrated in an existing fleet management system. The medical logbook and pharmacy modules were designed to offer more functions than just classic documentation and allow quick access to patient information. The included functions can support the nautical officer in his healthcare duties on the vessel.

Keywords: medical logbook; pharmacy; health care on board

## 1. Introduction

A great challenge regarding health management on merchant vessels is that all health care is performed by nautical officers. This duty and its extensive analogue documentation constitute an additional occupational burden aside from other nautical tasks. The introduction of different software modules shall make the documentation of medical work for the officer responsible for healthcare faster and easier.

## 2. Material and Methods

In cooperation with an IT company, diverse health modules were developed that are currently integrated in an existing fleet management system. The key modules are the digital medical logbook and pharmacy. Suggestions and requests of seafarers were considered for modules' development.

### 3. Results and Discussion

The developed medical logbook module offers more functions than just classic documentation. Its most important advantage is the summary of several examinations in one entity to show the medical history of a case (Figure 1). There is also the option to attach documents and files to the entity (e.g., radiographs). Furthermore, it is possible to use a filter and sort function to quickly access older comparable cases or past examinations of a certain patient.

A linked connection to the pharmacy module automatically updates the pharmacy inventory when documenting the prescription of medication in the medical logbook. Besides containing medication inventories, the pharmacy module also warns the user if medication is about to expire (Figure 2). Other modules include the documentation of vaccinations and medical certificates. There is the possibility to export data either as a list of all examinations according to the paper versions of the classic medical logbook for port authorities or as one complete case, e.g., in case a patient visits a doctor in a port. The system also supports a



Citation: Belz, L.; Dengler, D.; Reck, C.; von Münster, T.; Heidrich, J.; Harth, V.; Oldenburg, M. e-Healthy Ship: New Approaches for Improving Health Management on Merchant Vessels. *Med. Sci. Forum* **2022**, *13*, 32. https://doi.org/10.3390/msf2022013032

Academic Editors: Christos Hadjichristodoulou and Varvara Mouchtouri

Published: 16 March 2023



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semi-automatic creation of Telemedical Maritime Assistance Service (TMAS) protocols and forms for insurances.

Seaman		Reporting Date	Description / Symptoms	Illness / Injury Type	Examination history	Condition		
9	Foxtrot, Francoise SECOND ENGINEER	05.02.2020	Eczema under both armpits sus	Other	17.02.2020 by Seafarer, 05.02.2020 by Seafarer	n/a		0
0	Foxtrot, Francoise SECOND ENGINEER	14.02.2020	Fell from ladder in Cargohold left leg broken	Fracture	15.02.2020 by Doctor, 14.02.2020 by Seafarer	Unfit for duty	<b>±</b>	0
9	Hotel, Henrietta FOURTH ENGINEER	13.02.2020	patient fainted, high temperatu	Infectious disease	15.02.2020 by Doctor, 14.02.2020 by Seafarer,	Unfit for duty	Ĥ	
	Alpha, Alonso MASTER	11.02.2020	Headache, fever, coughs	Infectious disease	13.02.2020 by Seafarer, 11.02.2020 by Seafarer	Unfit for duty		
0	Uniform, Ulysses DECK CADET	12.02.2020	light burns on lower arm	Burn	12.02.2020 by Seafarer	Fit for duty		
	Tango, Tanja FITTER	10.02.2020	dry skin between toes, both feet	Other	10.02.2020 by Seafarer	n/a		0
0	Uniform, Ulysses DECK CADET	08.02.2020	Headache since 4 days	Other	08.02.2020 by Seafarer	n/a		0
	Victor, Victoria	06.02.2020	sick, headache, blood in face aft	Concussion	06.02.2020 by Seafarer	Unfit for duty		0
	Echo, Elias CHIEF ENGINEER	05.02.2020	Infection of tip on toe on right f	Other	05.02.2020 by Seafarer	Fit for duty		

Figure 1. Edited screenshot of the digital medical logbook with dummy data. Lines indicate case entities.

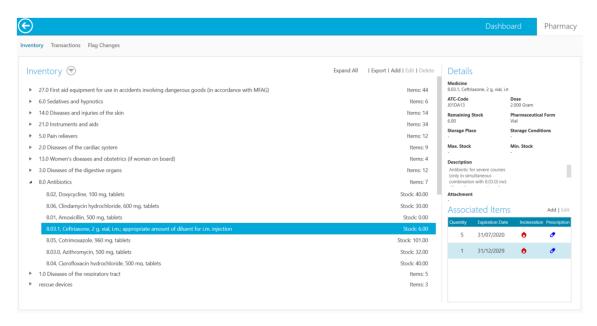


Figure 2. Edited screenshot of the digital pharmacy inventory with dummy data.

### 4. Conclusions

The included functions can simplify tasks for the nautical officer responsible for healthcare on the vessel. A preliminary version with dummy data has been tested on a merchant vessel for practicability and usability and is currently being optimized.

**Author Contributions:** Conceptualization, L.B., D.D., C.R., T.v.M., J.H., V.H. and M.O.; methodology, L.B., D.D., T.v.M. and M.O.; writing—original draft preparation, L.B.; writing—review and editing, L.B., D.D., C.R., T.v.M., J.H., V.H. and M.O.; visualization, L.B.; project administration, M.O. All authors have read and agreed to the published version of the manuscript.

**Funding:** This research was funded by the European Regional Development Fund (ERDF) and the Authority for Health and Consumer Protection of Hamburg.

Institutional Review Board Statement: Not applicable.

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**Informed Consent Statement:** Not applicable. **Data Availability Statement:** Not applicable.

**Conflicts of Interest:** The authors declare no conflict of interest.

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