

# *innovatus 2022*

*A Journal on Computing Technology Innovations*  
Volume 5 (2), 2022

All rights reserved.

Copyright © 2022 by Department of Information Science and Technology,  
University of Asia and the Pacific

**ISSN (Print): 2651-6993**

## **Editorial Advisory Board**

Umberto Zona, Ph.D. - Roma Tre University, Italy

Varsolo Sunio, Ph.D. – Department of Science and Technology-Philippine Council for Industry,  
Energy, and Emerging Technology Research and Development

Prospero Naval, Jr., Ph.D. – University of the Philippines

Samrat Ray – Polytechnic University, Russia

Janice Velasquez – Lyceum of the Philippines University

Ruel Maningas, Ph.D. – Program Director, Masters of Applied Business Analytics, UA&P School of  
Management

Florencio O. Gaa, Ph.D. – Dean, UA&P School of Sciences and Engineering

Enrique M. Ligot, Dcomm. – Vice Dean, UA&P School of Sciences and Engineering

Noemi B. Torre, Ph.D. – Operations Committee Secretary, UA&P School of Sciences and Engineering

Edwin L. Olmos, Ph.D. – Chair, Department of Engineering and Natural Sciences

Cyrus Paolo M. Buenafe – Chair, Department of Information Science and Technology

Kimberly May M. Vallesteros – Chair, Department of Mathematics

Maria Beatrice Quilinguin – IT Industry Consultant

## **Guest Editor**

Varsolo Sunio, Ph.D.

## **Editor in Chief**

Giuseppe C. Ng

## **Cover Design**

Danica Sagayap

No part of this publication may be reproduced by any process without the written permission of the  
copyright holder except for brief sections to be used for academic and research related purposes.

For information,

☎ (+632) 8637-0912 to 26 ext. 336

✉ innovatus@uap.asia

❖ School of Sciences and Engineering,

5th Floor, CAS Building,

University of Asia and the Pacific,

Pearl Drive, Ortigas Center, Pasig City 1605, Philippines



©2022 by the authors. This article is an open access article distributed under the terms and conditions of the  
Creative Commons Attribution (CC-BY-NC-ND) license (<http://creativecommons.org/licenses/by/4.0/>)

# *about innovatus*

**Innovatus: A Journal on Computing Technology Innovations** is the official research journal of the University of Asia and the Pacific (UA&P), Department of Information Science and Technology. 'Innovatus' is the past participle of the Latin word 'innovare' or innovate. The research journal is a compilation of double-blind peer-reviewed research articles from the Yearly International Research Conference on Emerging Information Technology Trends in Asia and the Pacific. The journal accepts original scholarly works in the areas of Information Technology, Computer Science, Information System, Computer Engineering, and allied disciplines.

## **Special Thanks**

Alyssa Ashley Capco

Isabella Molo

Miguel Antonio Li

Paula Andrea Belo

# *from the guest-editor*

As part of my work with a government agency, I had to conduct consultations with various stakeholders to get input from them regarding the R&D agenda for the transport sector in the next 5 years. I interviewed more than 50 stakeholders, representing various organizations from the government, academia, and the industry. One of the major R&D themes that emerged is the sector's transformation through digital technologies.

I inquired with the Editor-in-Chief of Innovatus if we could issue a call for perspective papers that would further elaborate and refine the agenda. Since the scope of the journal concerns, broadly, the applications of information technologies, we thought that the theme of the digital transformation of the transport sector is relevant to the journal. A Call for Perspectives Papers was issued in July 2022, inviting stakeholders to submit short viewpoints articles related to the theme of “digital transformation of the transport sector”. Perspective papers, and not full-length articles, are deemed more appropriate since we want contributions that present forward-looking viewpoints on desirable directions and potential developments in the field. Submitted papers must go through a rigorous peer review process with a minimum of two reviewers.

We present in this Special Issue six articles co-authored by a broad range of stakeholders. Two papers present unique perspectives and proposed initiatives for the development of intelligent transport solutions (ITS) for road-based public transport systems. Three articles tackle the need for the digital transformation of the maritime transport sector. One article introduces a case for the use of digital technologies for marine plastic litter pollution monitoring.

We thank the authors for their contributions. We hope that readers will enjoy reading these viewpoints papers and be able to find inspiration for their own research and for pushing further the boundaries of the field.

Varsolo C. Sunio, PhD  
Guest Editor  
November 26, 2022



# *from the editor-in-chief*

*'Innovatus: A Journal on Computing Technology Innovations.'*

From this simple name embodies the very essence of my vision for this journal. The genesis of all great innovations is *Ideation*. There are many research publications that focus on actual research and development. For this edition, we wanted to be able to start the research conversation through the perspectives and concepts of many experts in the digital transformation of the transportation sector. The papers you will see in this issue, then, are concepts and expert opinion articles that will hopefully help raise awareness on the issues besetting this sector and spearhead more research efforts in those areas.

I would like to extend my deepest gratitude to Dr. Sunio for his tireless work on this issue. Without him, none of this would have been possible.

Giuseppe C. Ng  
Editor-in-Chief

# *table of contents*

Development of Intelligent transportation system from the perspective of local government units, national government agencies and transportation cooperatives .....	1
Driving efficiency, competitiveness and innovation in the maritime transportation sector through API-based integration and collaboration .....	7
S&T Interventions for Intelligent Traffic Management Systems .....	11
A Centralized Document Processing and Support System (CeDoPSS) for Philippine Registered Vessels .....	14
MaDox: A Digital Tracking and Scheduling System for the Dry Docking of Philippine-flagged Vessels .....	17
A Call for Digital Transformation in the Marine Environmental Protection Sector: A case for marine plastic litter pollution monitoring .....	21

