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Report on the Sixth ENRI International Workshop on ATM/CNS (EIWAC2019)

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1. Introduction

The Sixth ENRI International Workshop on ATM/CNS (EIWAC2019) was held on October 29-31, 2019 at the Nakano Central Park Conference, Tokyo, Japan. It was organized by the Electronic Navigation Research Institute (ENRI), National Institute of Maritime, Port and Aviation Technology (MPAT), Japan, in cooperation with the IEICE and other organizations. The theme of EIWAC2019 was "Exploring Ideas for World Aviation Challenges."

2. EIWAC History and Overview

EIWAC is a biennial event which started in 2009 [1]. It has focused on the research and development of operational improvement in Air Traffic Management (ATM) and its enabling technologies in Communication, Navigation and Surveillance (CNS). It has contributed to the global harmonization of research and development with the participation of a wide range of speakers from international organizations, regulators, service providers, industries, research organizations, universities, and airspace users etc.

On the first day, we had seven keynote presentations and a panel discussion by opinion leaders, and on the second and third day, three special presentations and 18 technical sessions were held. In total, 63 oral presentations and 9 poster presentations were presented at three parallel technical sessions. All the presentations were categorized into Academic Track of research activities and Interchange Track of latest technical information exchange. The total number of participants was 861 from 19 countries. Four exhibitions of SWIM (System Wide Information Management), Foreign Object Debris Detection System, SBAS (Satellite-Based Augmentation System) and CARATS (Collaborative Actions for Renovation of Air Traffic Systems) Open data took place in the foyer. The welcome reception was held on the first day evening in the foyer.

3. Keynote Speech

EIWAC2019 was commenced with the opening address by Prof. Hiroyuki Yamato, the President of MPAT.

The plenary session was organized with keynote speeches and a panel discussion.

At first, Mr. Stephen P. Creamer (Director, Air Navigation Bureau, International Civil Aviation Organization (ICAO)) began with an introduction to

Fig. 1 Keynote Speech by Mr. Stephen Creamer Director, ICAO ANB.

the Global Air Navigation Plan (GANP) and the Global Aviation Safety Plan (GASP), and discussed about the latest initiatives such as the digital aviation ecosystem, expanding new users and new needs in the aviation, cyber security, trust frameworks, and digital certification.

Mr. Florian Guillermet (Executive Director, SESAR Joint Undertaking) focused on Digital Transformation (DX) in the aviation and activities to build infrastructure suitable for future air traffic expansion in his presentation.

Mr. Christopher Loring (Manager, NextGen International Office, FAA) spoke on NextGen's progress and achievements, international initiatives, the path to TBO (Trajectory Based Operations), prospects for the next 20 years (high altitude operations, UAM (Urban Air Mobility)), UTM (Unmanned Aircraft Systems Traffic Management), and activities for the future.

Mr. Tohru Kawaharabata (Director, Air Navigation Services Department, Japan Civil Aviation Bureau) stated on the progress of CARATS, such as SWIM as well as challenges for PBN (Performance Based Navigation), data communications, international harmonization and international digitization.

Mr. Naoki Tanaka (Director of Corporate Strategy Department, Corporate Strategy & Planning Division, JAL) mentioned on the outlook of the aviation market, activities of the Innovation Lab for AI, robotics, maintenance applications, VR training, and corporate strategy, including efforts to achieve the SDGs.

Mr. Yoshiaki Tsuda (Vice President, ANA Digital Design Lab & Avatar Division, ANA), Mr. Akira Fukabori, and Mr. Kevin Kajitani (Co-Directors Avatar Division, ANA) introduced drone and space businesses as innovation initiatives, and presented about its avatar activities (ANA AVATAR XPRIZE with the X Prize

Foundation, Avatar X Program with JAXA, platform avatar-in).

Mr. Shigeru Ozeki (Director General, ENRI) introduced the accumulation of aviation knowledge and the digitization of ATM/CNS for that purpose, the relationship between innovation and standardization, and the use of EIWAC.

4. Panel Discussion

The panel discussion was focused on the "Digitalization in Aviation: A Standardization Perspective," which was the final item of the plenary session. Digital transformation in aviation was an emerging topic and was referred to as a pivotal element in terms of future technological proliferation. Moderators were Mr. William C. Johnson (NASA), who is one of the EIWAC TPC (Technical Program Committee) external committee members and Mr. Hajime Yoshimura (JCAB), who is a former President of the ICAO Air Navigation Commission. Panelists were Mr. Creamer (ICAO), Mr. Terry McVenes (President and CEO, RTCA), and Mr. Christian Schleifer (Secretary General, EUROCAE).

Initially, the topics were provided by the Standards Developing Organizations EUROCAE and RTCA, followed by discussions by moderators and questions from the audience. Discussions were held on the need for faster standardizations and regulations to ensure safety while responding to new users in the aviation field, and the effectiveness of gathering and discussing stakeholders from the early stage of standardization.

5. Invited Talks

Mr. Christian Schleifer (EUROCAE) delivered a presentation on current and future aviation standardization activities in EUROCAE. Mr. Akbar Sultan (Director, Airspace Operations and Safety Program, NASA) presented recent activities on NASA Aeronautics Research Mission Directorate. Mr. Patrick Souchu (Program Director, DSNA) expressed on sharing trajectory information for TBO.

6. Technical Sessions

In total, 18 technical sessions were divided into 14 categories such as ATM Performance / ATM Modelling / Airport Management / AI for ATM / Aviation Weather / Trajectory Management / UTM / Traffic Capacity & Congestion Management / SWIM / Surveillance / Aviation Safety / Global Tracking & Related Technologies / GNSS / Space Weather.

7. Student Awards and Selected Papers

Since the 4th EIWAC (2015), TPC has selected excellent student presenters and awarded the "Best Student Paper Award" with the aim of encouraging young ATM/CNS researchers. Mr. Philippe Monmousseau (ENAC, France Civil Aviation Univ.) was the winner of the EIWAC2019 Best Student Award for the paper titled "Passengers on social media: A real-time estimator of the state of the US air transportation system". This study is about estimating the number of delayed flights at major airports in the United States using social media Twitter data.

Fig. 2 EIWAC2019 Keynote Speakers, TPC members and guests.

Since EIWAC2013, papers with innovative research ideas and outstanding quality are reviewed and selected for the publication in the "Air Traffic Management and Systems" [2-4] series in collaboration with Springer. The fourth book in the series, "Selected Papers of EIWAC2019" is under process for publication.

8. Conclusion

At EIWAC2019, we learned about international initiatives to address new aviation users, the use of ICT-related technologies such as digital transformation and trust frameworks in the aviation field.

A post survey conducted showed that 87% of the respondents marked a good rating while 88% expressed their interest in participating in the next EIWAC.

The next EIWAC is scheduled to be held in autumn 2021 in Tokyo. Call-for-Papers for EIWAC2021 will be released in autumn 2020. Please visit our EIWAC site for further information at the following URL. We welcome your submission to EIWAC.

http://www.enri.go.jp/eiwac/index_e.html

9. Acknowledgment

ENRI thanks international organizations, national administrative agencies, service providers, operators, manufacturers, research organizations, universities, and academic societies for their support in making EIWAC2019 a great success.

ENRI also thanks the external committee members of TPC who made great contributions to review and assign papers for technical sessions.

10. References

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[4] ENRI ed., "Air Traffic Management and Systems III - Selected Papers of the 5th ENRI International Workshop on ATM/CNS (EIWAC2017)," ISBN 978-981-13-7085-4, Springer, 2019.