

Modeling and Simulation as an approach to create Awareness of Thailand Aerospace Technology Ambition

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Abstract— Thailand's ambition to utilize space as a domain to demonstrate indigenous capacity in science and technology, not to mention the joint venture ThaiChote remote sensing satellite, has been doubtfully speculative due to pure abstraction of the program and lack of at least a visualization tool to generate project awareness. An abstract sounding rocket project's view and concept of ignition at a launch site through to a separation stage in space needs visuals and audio to convey intended messages to an audience. This research paper explains the processes that the authors adopted to turn intangible and ideal abstraction into a visualization product, which has been under continued research and development within the authors' modeling and simulation research group. The paper describes the purpose of the video version of the modeled and simulated sounding rocket when presented as a moving backdrop during the ongoing panel discussion of top executives from space-related agencies and before the eye-witness of researchers having various backgrounds in an international conference. The paper further explains how the authors explored the achievement of the modeled and simulated product as a medium to create awareness of the audience who attended the panel discussion on the topic national aerospace technology vision and ambition. A questionnaire was circulated and its contents were collected and analyzed to come up with the prior intent of the modeling and simulation tool. The survey result shows that most of the participants who attended the discussion were optimistic and aware of the sounding rocket project. Comprehension on each stage of the rocket launch and separation was visually perceived to the extent that the vision and ambition were widely embraced.

Keywords- Modeling and Simulation; Sounding Rocket; Awareness Creation

I. INTRODUCTION

Space has always challenged and attracted humankind who is ambitious to utilize space as a domain to demonstrate indigenous capacity in science and technology. Thailand is one of the countries that make use of the satellite technology for the benefits of communication, distance learning, agriculture monitoring, disaster management, navigation and military operation (FIG. 1). The first step of Thailand in space technology lies in its first satellite project called Thaicom. In 1993, Thaicom1, Thailand's first satellite was successfully sent to orbit. It was built by Hughes Space Aircraft and launched from Arianespace, France [1]. Since then, Thaicom project has been playing a significant role in the field of communication and education, particularly the distance learning via satellite. After that, Thailand's first earth observation satellite project was established by GISTDA (Geo-Informatics and Space Technology Development Agency, Public Organization). The earth observation satellite, ThaiChote or THEOS, was sent to orbit in 2008 by Dnapper rocket from Yasny rocket base, Russia. The process of sending the rocket from launching platform to space was first to launch the rocket to the south along the polar with deviate angle to the west 8.9 degrees. The rocket was driven from the ground for 110 seconds, up to an altitude of 60 kilometers, before the first stage was turned off, disengaged, and fell to the ground in Kazakhstan. Subsequently, the second stage of the rocket was ignited and propelled the rocket to climb up for another 180 seconds up to an altitude of 300 kilometers. The second stage of the rocket was separated and fell into the Indian Ocean. The rocket's last verse (Upper Stage) with the satellite as