An Overview of Mission Mangalyaan by Indian Space Research Mission

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I. INTRODUCTION

ISRO is a major body in India and leads space science research in India and also plays a huge role in the development of the country through education, agriculture, communication and defense projects. ISRO (Indian Space Research Organization) is the Indian space agency established in 1969 to develop India's indigenous space program. It is one of the six largest space agencies in the world. ISRO operates one of the largest fleets of Remote Sensing (IRS) and Information Communication Satellites (INSAT)serving the needs of the country through a network of centers, offices and research institutes across the country. ISRO works in the following areas: broadcasting, weather forecasting, disaster management, geographic information systems, navigation, cartography (maps), telemedicine, distance learning satellites, etc.

The need to explore planet mars?

Mars has fascinated humans since we first observed it as a star-like object in the night sky. Early on, its reddish hue separated the planet from its glowing siblings, each alluring in its own way, but no one else followed the reddish arc across Earth's sky. Then, in the late 1800s, telescopes first discovered a surface full of interesting features - patterns and landforms that scientists initially believed to be a living Martian civilization. We now know that there are no artificial structures on Mars.

Why did India launch Mangalyaan?

On November 5, 2013, the Indian Space Research Organization (ISRO) sent its first spacecraft to Mars. India built the Mangalyaan (English for "Mars craft") to explore the Red Planet and test key technologies needed to explore the inner solar system. Before India, only the United States, the Soviet Union and the European Space Agency ESA had successfully explored Mars.

Mangalyaan operated for seven and a half years, observing Martian landscapes and studying their composition with its five scientific instruments.

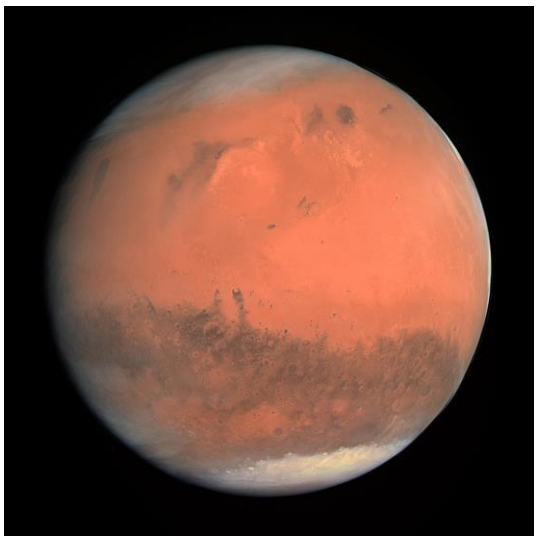

Figure 1: planet mars

Preparation for the mission

The following is a list of the Mars Orbiter Mission's 4 Primary Goals.

- Study of the atmosphere on Mars
- A study of Martian surface characteristics
- Morphology
- Mineralogy.

Background

The Mars Orbiter Mission (MOM) or Mangalyaan is a space probe launched by the Indian Space Research Organization in 2013.

Features

- Mangalyaan was India's first interplanetary mission.
- The indigenously-built space probe has been in Martian orbit since 2014.
- The mission made India the first Asian country and the fourth in theworld after Roscosmos, NASA, and the European Space Agency, toget to the planet

Objective of Mangalyaan

- India's Mangalyaan mission is aimed at studying Martian atmosphere.
- Its objective is to explore Martian surface features, mineralogy, morphology and atmosphere using indigenous scientific instruments.
- A crucial objective of MOM was to develop technologies required in planning, designing, management and operations of an interplanetary mission.

Rocket used

- MOM was launched aboard PSLV C-25 (an XL version of the PSLV).

Figure 2: PSLV C-25

Cost of Mangalyaan

- ISRO spent $75 million for mangalyaan, making it the least-expensivemission to mars to date

Planning for Mission Mangalyaan

The Mangalyaan mission, which was originally supposed to last six months, has been orbiting Mars for five years and is likely to continue for some time, Indian Space Research Organization (ISRO) director K Sivan said. In the past five years, India's first interplanetary venture, the Mars Orbiter Mission (MOM), has helped the Indian space agency prepare for Mars based on images from the Atlas orbit, Sivan said.

Execution for Mission Mangalyaan

Launch vehicle: PSLV-C25

- Time: 9:50 AM; Date: 5 November 2013 (launch into earth's orbit)
- Launch mass: 1337 kg: Power of the spacecraft: 840 W
- The mission was planned to last 6 months. Now, 3 years have elapsed sincethe mission was launched.
- The mission entered Mars orbit on 24 September 2014

Other Facts

- The entire charge cost India just 74 million dollars while the American Mars Mission costs ten times as much! It's indeed believed that Mangalyaan's entire budget was lower than several Bollywood and Hollywood budgets too, making it an inconceivable feat that the ISRO managed to pull off!
- Mangalyaan's cheap budget was also a direct result of using home-grown technology. Indian-made components and technology were given higherpriority than foreign imports, which was yet another commendable milestone that India achieved through this mission.
- The original build of Mangalyaan was projected to last for only six months, but it has taken the world by surprise after having completed over 5 full years in Mars ' orbit. The mission has also encountered several trouble points. The mama went through a communication knockout between June 2, 2015, to July 2, 2015. still, the spacecraft arose out of this blackout through successful auto control systems.

Conclusion

As ISRO has already put an orbiter for both Moon and Mars, landing a rover to lunar surface will be really critical. It will also provide us a base for more complex Mangalyaan-2 for future.

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