

Print Media Coverage of ISRO Missions/Launches: A Ten Year (2011-2020) Study of Selected English Dailies

REHANA UMMER

Library Officer 'C', Library & Documentation
ISRO Headquarters, Antariksh Bhavan, New BEL Road, Bangalore-560094
Karnataka. Email: rehana@isro.gov.in

IQBALAHMAD U RAJGOLI

In-Charge, Library & Documentation
ISRO Headquarters, Antariksh Bhavan, New BEL Road,
Bangalore-560094 Karnataka. Email: iqbal786@isro.gov.in

ABSTRACT

The reporting of research and development is very important for any organisation as it is not only simple reporting to keep the general public updated on the developments but as it also involves critical evaluation of different programmes and activities. The present study is the quantitative analysis of 2382 unique news items, related to 59 ISRO missions launched during the period 2011-2020, retrieved from the Bangalore edition of four popular English print newspapers namely *Deccan Herald*, *The Hindu*, *The New Indian Express*, and *The Times of India*.

The collected data was further categorised into different missions based on their applications for analysis. By applying one full credit for each mission covered in the news items, a total of 3729 news items were found. Of all the ISRO missions launched during the period of study, GSLV-MkIII-M1/Chandrayaan-2 had the highest news coverage with 742 (19.89 per cent) news items followed by PSLV-C25/Mars Orbiter Mission (Mangalyaan) with 601 (16.12 per cent) news items. The study further observed that there is no uniformity in reporting and coverage among the selected newspapers.

Keywords: Media coverage, Newspapers, Satellite launches, ISRO missions

Introduction

Indian Space Research Organisation (ISRO) is a government organisation involved in the overall space activities in India.

ISRO, one of the six largest space agencies in the world is charged with the conduct of research in space technology and applications. Under this portfolio, major activities such as realisation of satellites for various applications, launch of satellites through indigenously developed launch vehicles, establishment of ground stations, operationalisation of space-based services to reach the user segments, etc. are carried out in a sustained manner.

Ever since the launch of Aryabhata, the first satellite on 19 April 1975, ISRO has been developing new technologies and applications for national and societal development. In its endeavour to unravel the unknown, ISRO also conducted interplanetary missions to Mars and Moon. Over a period of time ISRO has developed technologies for launching cost-effective missions which are highly appreciated and well acknowledged by the global space community^{1,2}. ISRO has not left any stone unturned to enhance its domain with initiatives like increased industry participation, satellite technology applications, periodical release of satellite data, training of students and foreign nationals, promoting space applications and awareness through competitions, development of apparatus to aid in tackling the ongoing COVID-19 pandemic, etc.

ISRO's missions are primarily aimed towards national development and governance. Dedicated missions of ISRO are aimed at helping the common man through societal based application programmes. Hence, research, development and applications of various missions and satellites must be brought to the notice of the general public. ISRO's research and development activities and other programmes are regularly updated on its website. ISRO also effectively uses social media platforms such as Twitter and Facebook to engage and maintain public interest in its latest developments. Thus, media visibility and coverage of ISRO's missions, activities and programmes and reporting them to the general public through mass media such as newspapers are very essential.

Among print media, newspaper plays a significant role in reporting major activities and programmes of ISRO. Newspapers are one of the important platforms and arguably the best and most reliable source for communicating research and

development activities of any nation or organisation to the remotest population with in-depth analysis and coverage. What makes newspapers so important is also the fact that coverage and analysis include economical, political, ethical and social aspects. The Quantity of Coverage Theory states that the quantity of news items covered is a good indicator of the importance of a news item³. According to the latest Cvoter Media Consumption Survey 2020, print media remains the most credible and valued source of information⁴.

Review Literature

A brief literature review is conducted on the media coverage of space missions and launches. Clark and Illman's⁵ (2003) study characterised *New York Times* coverage of the main elements of the space arena (civil, commercial, national security, and the associated legal/regulatory issues) during the year 2000 and discussed some implications of this coverage. Dittmer⁶ (2007) addressed the representation of the planet Mars during the 1997 Mars Pathfinder mission through a content analysis of major US newspapers as well as transcripts of television and radio news shows. The article particularly focused on how the Sojourner rover technology simulated human activity on the surface of Mars and led to the constitution of Mars as a place of social activity, thereby enabling the language of colonialism.

Jergovic and Miller⁷ (2008) examined the UK press coverage of two space missions: the Beagle 2 mission to Mars and the Cassini-Huygens mission to Saturn and its moon Titan. The study observed that even though the Beagle 2 mission failed it didn't affect the coverage of the Cassini-Huygens mission. Priyanki Sinha⁸ (2017) in her dissertation explored how space exploration is framed on a social media platform (YouTube) to increase public awareness about space science and analyzed public comments in response to those videos to understand the trends, patterns, tones, and perceptions of YouTube commenters. The study analyzed public comments in response to forty-three video transcripts to understand the trends, patterns, tones, and perceptions of YouTube commenters. Analysis of YouTube comments revealed that the majority of the comments posted

directly in response to the videos are positive, indicating appreciation and praise for NASA and the space exploration mission.

Ryan⁹ (2017) focused on the official Twitter feed of the lander of the European Space Agency's Rosetta Mission (Philae Lander), active between October 2010 and September 2016, to illustrate an instance of popularisation of space activities. The paper concludes by considering the potential role that social media can play in communicating scientific endeavours in space, achieving the goals of informing, enthusing and engaging the public.

Mace and Schwalbe¹⁰ (2020) compared the framing of Mars coverage from 2011 through 2016 in three influential newspapers in the United States, where NASA and many private companies lead the charge, with three newspapers in the United Kingdom, an allied yet competitive country with less of a vested interest in reaching Mars.

Lloyd¹¹ (2021) in his thesis provided a longitudinal content analysis of NASA press materials and *New York Times* newspaper articles from 1963 to 2011 with regards to various sampled, crewed and uncrewed spaceflight missions. The study also explored how NASA's models to inform journalists about key facts have changed.

In this brief literature review, it is observed that research conducted on the media coverage of space activities such as satellite launches and planetary missions using various qualitative and quantitative tools are restricted to a few important missions over a period of time by retrieving data from newspapers and social media platforms such as Twitter, YouTube, etc. However, a comprehensive quantitative study comprising the media coverage of all the missions conducted by a particular space agency or a nation covering data for a decade is not conducted nationally or internationally. In particular, the study on media coverage of space missions and launches of ISRO is not conducted by any author. Hence, the present study holds merit in terms of sample, coverage and analysis.

The Objective of the Study

ISRO has launched 366 satellites during 2011-2020 of which 63 are Indian satellites and 303 are foreign satellites belonging to 31 countries¹². ISRO has launched missions for earth observation, navigation and communication. It has also conducted planetary missions to gain new knowledge and launched experimental missions to test new technologies for further improvement of existing infrastructure.

Some of the most important missions launched during this period include AstroSat, Mars Orbiter Mission (Mangalyaan), IRNSS (Indian Regional Navigation Satellite System – NavIC), Chandrayaan-2, Indo-French MEGHA-TROPIQUES and SARAL Satellites and Indo-Russian YOUTHSAT. During this period ISRO also launched satellites for Indian universities and academic institutes. Through the PSLV-C37 mission, ISRO launched 104 satellites including 101 co-passenger satellites of international customers on a single rocket and set the world record.

With the many historical missions launched during 2011-2020, it makes an ideal period to study, understand and analyse the extent of coverage in print media. The prime objective of the study is the quantitative analysis of the extent of coverage of ISRO's missions in the Bangalore edition of print newspapers such as *Deccan Herald*, *The Hindu*, *The New Indian Express*, and *The Times of India* based on their subscription in ISRO HQ Library. For analysis and discussion, the retrieved data was further categorised into six main categories based on the application of mission.

Data Collection Methodology

ISRO missions during the study period were either reported as news item, article, editorial, letter to the editor, interview, pictograph or infographic. All these were considered as news items for this study. Each news item related to a specific mission was further categorised into pre-launch and post-launch period coverage for analysis. Any news item published before the launch of a specific mission was treated as pre-launch period coverage and after the launch was treated as post-launch period coverage.

All possible efforts were made to collect news items related to all the ISRO missions launched during 2011-2020 from the four dailies selected for this study. Each news item published during the study period was carefully read to find out whether it mentions anything about the mission, launch vehicle used in the mission, satellite(s), or any of the payloads in the satellites launched between 2011 and 2020. For example, for a news item to be categorised under PSLV-C25/Mars Orbiter Mission (MOM), it should at least mention PSLV-C25 or Mars Orbiter Mission or any of the payloads in Mars Orbiter Mission. With this methodology, a total of 2382 unique news items were retrieved from the selected four newspapers during the period 2011-2020.

While categorising the news items, it was noted that some news items had information on more than one mission or satellite. In such cases, for each mission or satellite one full credit was given and categorised under the respective mission headings. For example, a news item on Chandrayaan-2 might mention Mars Orbiter Mission. In that case, the same news item was classified under Chandrayaan-2 as well as Mars Orbiter Mission headings and further categorised as pre-launch/post-launch coverage. Because of this method of categorisation i.e., recurrence of the same news item in different missions, a total of 3729 news items were categorised, of which 1590 were in pre-launch and 2139 were in the post-launch period.

Data Interpretation

ISRO launched a total of 59 missions during 2011-2020 including 11 satellites launched using foreign launch services (Ariane launch vehicle). A total of 2382 unique news items reporting the launches during 2011-2020 were retrieved from the selected four print dailies. The number of news items retrieved from each newspaper is presented in Table-2. The data from Table-1 shows that the highest number of 690 (28.97 per cent) news items were retrieved from *The Hindu* closely followed by 678 news items from *The Times of India* (28.46 per cent). For *Deccan Herald* and *The New Indian Express*, 531 (22.29 per cent) and 483 (20.28 per cent) news items were retrieved respectively.

Table 1: Distribution of news items

Newspaper	News items retrieved	Percentage
<i>The Hindu</i>	690	28.97
<i>The Times of India</i>	678	28.46
<i>Deccan Herald</i>	531	22.29
<i>The New Indian Express</i>	483	20.28
	2382	

The news items were further divided into six main categories such as earth observation, communication, navigation, space science, experimental and customer satellites based on their applications as shown in Table-2. As each mission, satellite or payload reported in the 2382 unique news items was given full one credit, a total of 3729 news items were found mentioning at least one or more of 59 missions launched during this period. Hence, of 3729 news items, 1421 (38.11 per cent) were found reporting one or more of the Planetary Observations and Space Science missions followed by 946 (25.37 per cent) news items reporting one or more of Communication missions. The 17 Earth Observation missions were reported in 635 (17.03 per cent) news items. The Navigation, Experimental and Customer Satellite missions were reported in 387 (10.38 per cent), 172 (4.61 per cent) and 168 (4.51 per cent) news items respectively.

Table 2: Number of news items retrieved based on the application of mission

Application of Mission	News items retrieved	Percentage
Space science	1421	38.11
Communication	946	25.37
Earth Observation	635	17.03
Navigation	387	10.38
Experimental missions	172	4.61
Customer satellites	168	4.51
	3729	

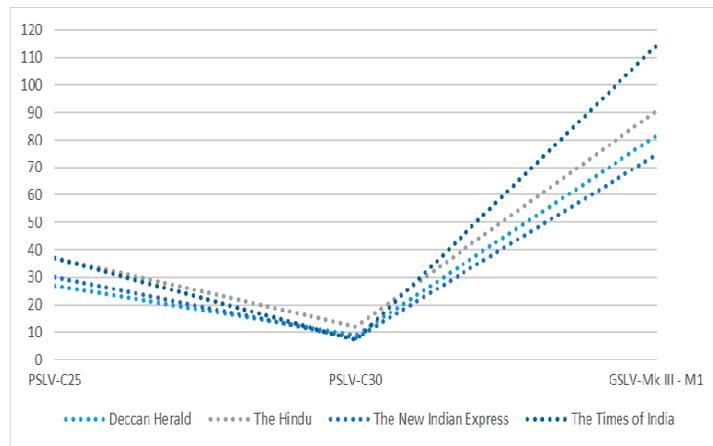
Of all the ISRO missions launched during the period of study, GSLV-MkIII-M1/Chandrayaan-2 had the highest news coverage with 742 (19.89 per cent) news items of which 363 (48.92 per cent) and 379 (51.08 per cent) were pre-launch and post-launch respectively. The second highest reported mission was the

PSLV-C25/Mars Orbiter mission with 601 (16.12 per cent) news items of which 131 (21.80 per cent) were pre-launch and 470 (78.20 per cent) were post-launch. GSLV-D5/GSAT-14 mission ranked third among all the missions with 106 (2.84 per cent) news items of which 59 (55.66 per cent) were pre-launch and 47 (44.34 per cent) were post-launch.

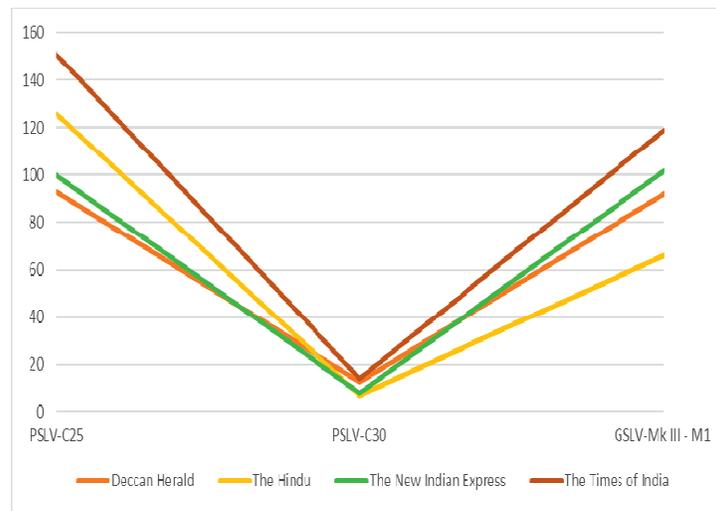
Category-wise Analysis

The data was further analysed and discussed as per different categories based on the application of the mission.

Space Science Missions: A total of 1421 (38.11 per cent) news items were retrieved reporting one or more of the three space science and planetary observation missions such as Mars Orbiter Mission, AstroSat mission and Chandrayaan-2 mission launched during 2011-2020. The GSLV-Mk III — M1/Chandrayaan-2 mission was reported in 742 (52.22 per cent) news items of which 363 (48.92 per cent) were pre-launch and 379 (51.08 per cent) were post-launch. The Mars Orbiter Mission was reported in 601 (42.29 per cent) news items of which 131 (21.80 per cent) were pre-launch and 470 (78.20 per cent) were post-launch. The PSLV-C30/Astrosat mission was covered in 78 (5.49 per cent) news items of which 36 (46.15 per cent) were pre-launch and 42 (53.85 per cent) were post-launch. The coverage data is graphically presented in Fig. 1.



(a)



(b)

Figure 1(a & b): Pre and Post Launch Coverage of Space Science Missions.

Communication Missions: During 2011-2020, ISRO launched 19 Communication satellite missions and 946 (25.37 per cent) news items were retrieved reporting either one or more of these missions. The GSLV-D5/GSAT-14 mission was highly reported with 106 (11.20 per cent) news items of which 59 (55.66 per cent) were pre-launch and 47 (44.34 per cent) were post-launch. The GSLV-F09/GSAT-9 mission was reported in 93 (9.83 per cent) news items of which 51 (54.84 per cent) were pre-launch and 42 (45.16 per cent) were post-launch. This was closely followed by GSLV-F08/GSAT-6A which was reported in 91 (9.62 per cent) news items of which 36 (39.56 per cent) were pre-launch and 55 (60.44 per cent) were post-launch. The coverage data is graphically presented in Fig. 2.

Earth Observation Missions: A total of 635 (17.03 per cent) news items were found discussing either one or more of the 17 Earth Observation missions launched during 2011-2020. Of the 17 Earth Observation missions, PSLV-C37/Cartosat-2 series satellite mission was reported in 79 (12.44 per cent) news items of which 15 (18.98 per cent) were pre-launch and 64 (81.02 per cent) were post-launch. The PSLV-C19/RISAT-1 mission was

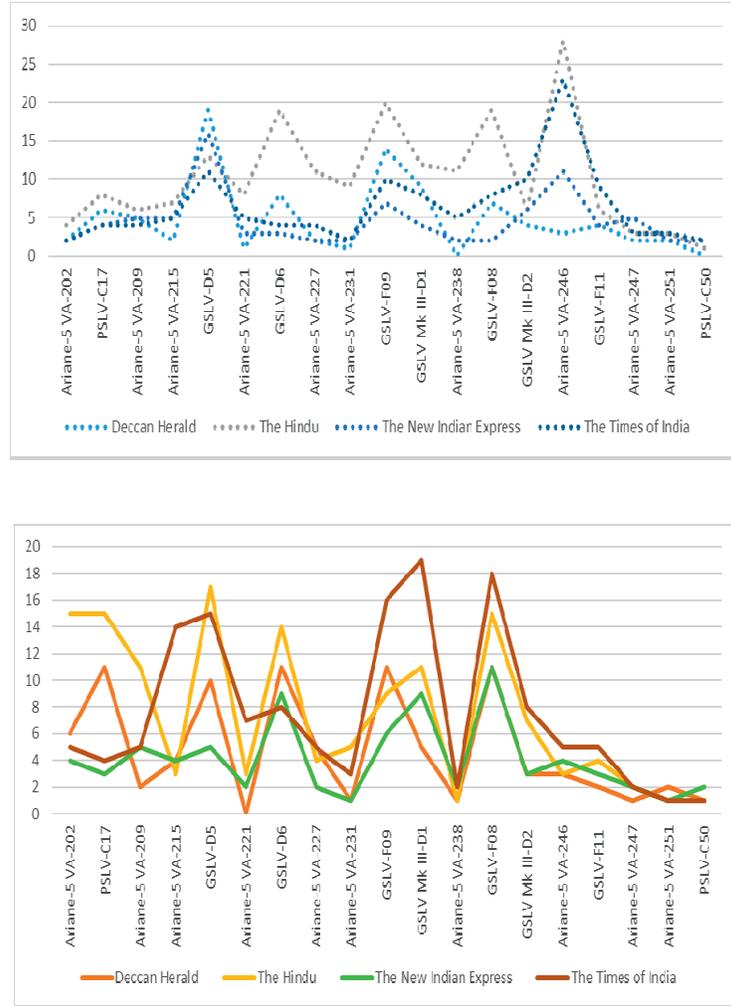


Figure 2: Pre and Post-launch Coverage of Communication Missions

reported in 56 (8.82 per cent) news items of which 15 (26.78 per cent) were pre-launch and 41 (73.22 per cent) were post-launch and was closely followed by PSLV-C35/SCATSAT-1 mission with 50 (7.87 per cent) news items of which 24 (48.00 per cent) were pre-launch and 26 (52.00 per cent) were post-launch. The coverage data is graphically presented in Fig. 3.

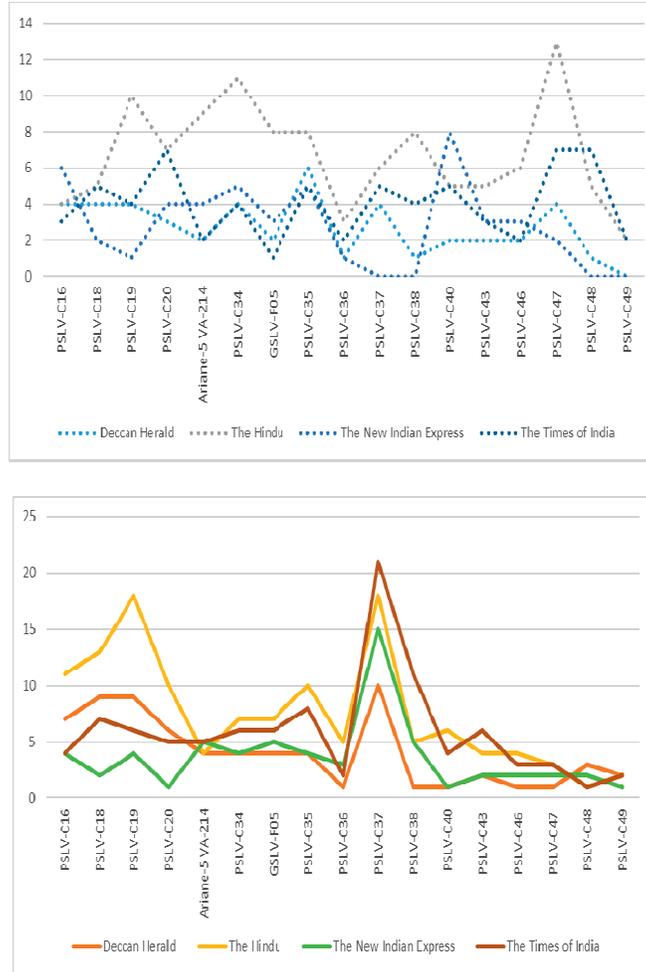


Figure 3: Pre and Post Launch Coverage of Earth Observation Missions

Navigation Missions: ISRO launched 9 navigation missions and a total of 387 (10.38 percent) news items were found reporting either one or more of these missions launched during 2011-2020. The PSLV-C22/IRNSS-1A mission was highly reported among the Navigation satellites with 101 (26.10 per cent) news items of which 30 (29.70 per cent) were pre-launch and 71 (70.30 per cent) were post-launch. The PSLV-C24/IRNSS-1B mission was reported in 39 (10.08 per cent) news items of which 13 (33.33 per cent) were pre-launch and 26 (66.67 per cent) were post-

launch. This was closely followed by PSLV-C27/IRNSS-1D and PSLV-C41/IRNSS-1I missions reported in 36 (9.30 per cent) news items. The coverage data is graphically presented in Fig. 4.

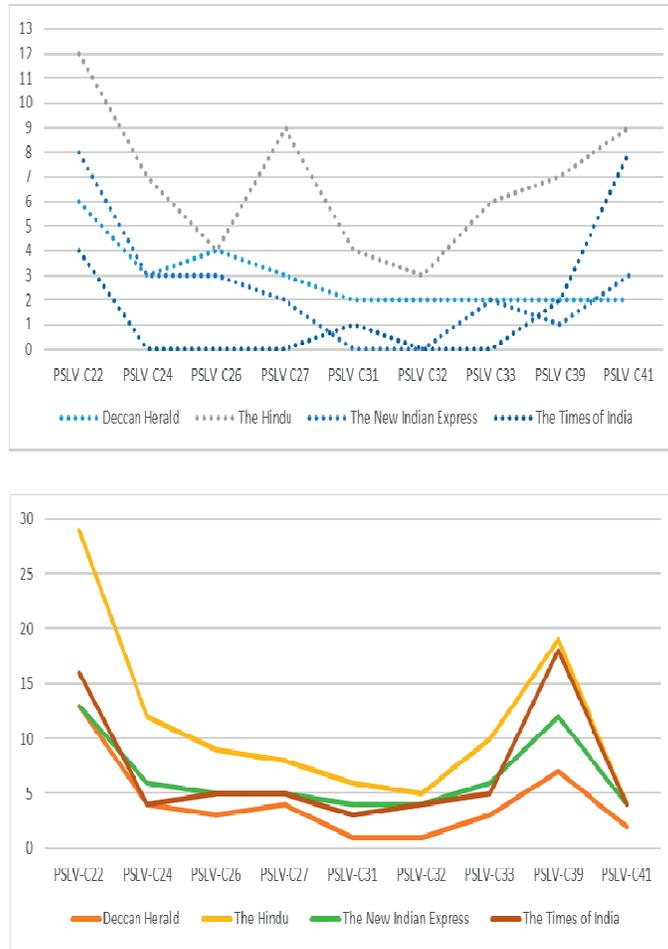


Figure 4: Pre and Post Launch Coverage of Navigation Missions

Experimental Missions: ISRO conducted 4 experimental missions during 2011-2020 and these were reported in 172 (4.61 per cent) news items. Of the 4 experimental missions, the LVM-3/CARE mission was highly reported with 74 (43.02 per cent) news items of which 36 (48.65 per cent) were pre-launch and 38 (51.35 per cent)

were post-launch. Crew Escape System mission was reported in 14 (8.14 per cent) news items of which 2 (14.28 per cent) were pre-launch and 12 (85.72 per cent) were post-launch. The other two experimental missions such as reusable launch vehicle technology demonstrator and scramjet engine technology demonstrator were also fairly covered and reported in the selected newspapers. The coverage data is graphically presented in Fig. 5.

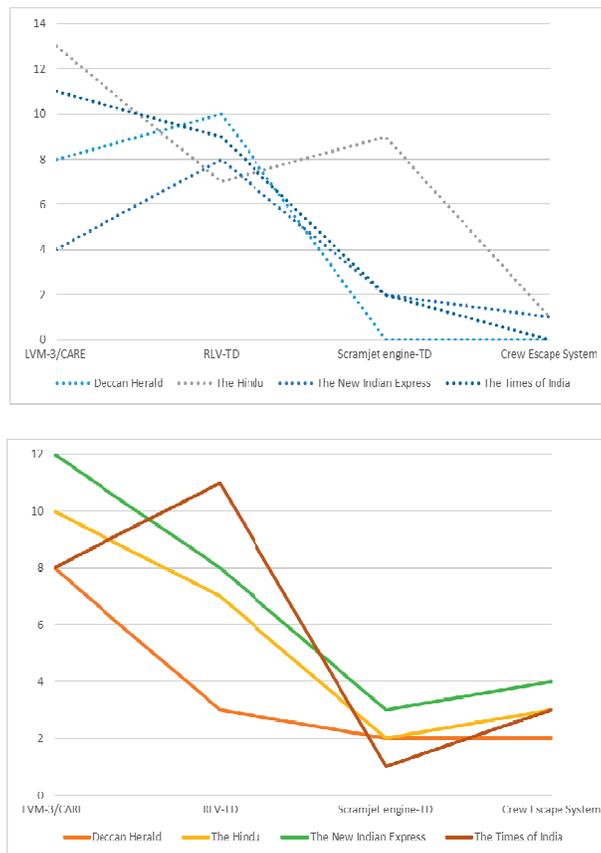


Figure 5: Pre and Post Launch Coverage of Experimental Missions

Customer Satellite Missions: During the period of study, ISRO launched 7 missions including the two missions for DRDO (PSLV-C44 and PSLV-C45), exclusively for countries like France (PSLV-C21 and PSLV-C23), UK (PSLV-C28 and PSLV-C42), and Singapore (PSLV-C29). These missions were found

reported in 168 (4.50 per cent) news items. The PSLV-C21 mission had the highest coverage amongst them with 32 (19.05 per cent) news items – 15 (46.87 per cent) pre-launch and 17 (53.13 per cent) post-launch and was closely followed by 31 (18.45 per cent) news items reporting PSLV-C23 mission of which 18 (58.06 per cent) were pre-launch and 13 (41.94 per cent) were post-launch. The other customer satellite missions were covered and reported in a good number of news items. The coverage data is graphically presented in Fig. 6.

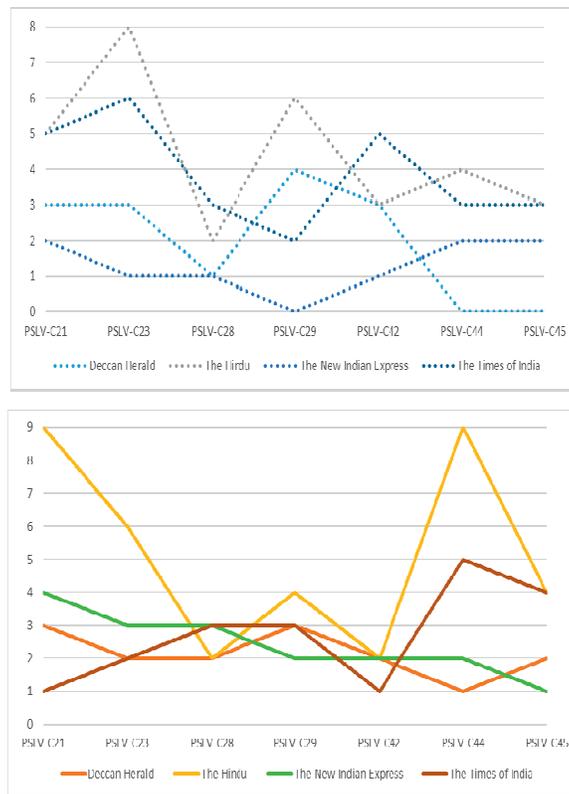


Figure 6: Pre and Post Launch Coverage of Customer Missions

Observations

Based on the collected data and further interpretation, the following observations were made for the missions that garnered more reporting and coverage. The possible reasons behind spikes in coverage of certain missions are presented below.

- The GSLV-MkIII-M1/Chandrayaan-2 mission received the highest news coverage, not only among the space science missions but of all the missions launched during 2011-2020. Ever since the approval of the Chandrayaan-2 mission in September 2008, ISRO kept the nation abreast with the progress of the mission.

As it was a complex technological mission with ISRO to touch an alien world for the first time, it had created a lot of interest among the common man in general and the student community in particular. Chandrayaan-2 mission comprised an Orbiter, Vikram Lander and Pragyan Rover. The Chandrayaan-2 mission was launched on 22 July 2019. During the progress of the mission, several earth-bound and lunar orbit manoeuvres were conducted. Some beautiful images of the earth, moon and lunar surface were released. As all possible details of the mission were made available through social media platforms and on ISRO website, these updates were also covered and reported in detail by the print media.

- The Mars Orbiter Mission (Mangalyaan) also succeeded in attracting the attention of print media. The Mars Orbiter Mission was launched on 5 November 2013 on the PSLV-C25 rocket. MOM was the first interplanetary mission launched by ISRO and the first mission by any country to succeed in entering Mars orbit on the first attempt. India also became the fourth nation to achieve Mars Orbit. It involved the development of technologies for designing, planning, management and operations of an interplanetary mission.

MOM was put into Mars orbit on 24 September 2014 after 298-day transit to Mars. The event was also witnessed by the Honourable Prime Minister Mr Narendra Modi. Ever since its announcement, ISRO released updates on the progress of the mission from time to time. These updates were also reported in the print media. From the launch till Mars orbit insertion several earth-bound and course correction manoeuvres were performed. MOM was also very significant as it was realised at a low cost, making it the most economic Mars mission till date. The valuable data gathered

through this mission was also released to the scientific community.

- GSLV-D5/GSAT-14 mission launched on 5 January 2014 was significant as it launched GSAT-14 communication satellite weighing 1,982-kg using the cryogenic engine built by ISRO. This mission also put India in the elite club of countries (US, Russia, France, Japan and China) with the ability to launch satellites weighing two-tonne in orbit.
- The IRNSS-1A launched on 1 July 2013 was the first of seven satellites of the IRNSS constellation to provide the country with an independent navigation satellite capability. The launch of the IRNSS constellation was completed with the PSLV-C32/IRNSS-II mission in April 2018. The IRNSS constellation was named as “NavIC” (Navigation with Indian Constellation) by the Honourable Prime Minister Mr Narendra Modi.
- The GSLV-F09 mission launched on 5 May 2017 carried 2,230-kg GSAT-9 satellite or South Asian satellite for use by countries of the South Asian Association for Regional Cooperation (SAARC). The primary objective of GSAT-9 was to provide various communication applications in Ku-band with coverage over South Asian countries. The satellite provided communication, broadcasting and internet services, disaster management, telemedicine, tele-education, and weather forecasting free of cost to neighbouring countries. It was hailed as a new face of space diplomacy and cooperation among the neighbouring countries.
- GSAT-6A launched by GSLV-F08 on 29 March 2018 was a high power S-band communication satellite. The satellite provided a platform for developing technologies such as the demonstration of 6m S-Band Unfurlable Antenna, handheld ground terminals and network management techniques that could be useful in satellite-based mobile communication applications. It was meant to complement GSAT-6 to support

military communications in hostile regions using handy ground terminals. However, contact was lost and the satellite went in communicado.

- Weighing about 5854 kg, GSAT-11, the heaviest satellite built by ISRO till date was launched on 05 December 2018, from Kourou launch base, French Guiana by Ariane-5 VA-246 rocket. GSAT-11 was part of ISRO's new family of High-throughput Communication Satellite (HTS) fleets that would drive the country's Internet broadband from space to untouched areas. GSAT-11 was earlier planned for launch on 26 May 2018. A few days before the launch, ISRO brought it back from Kourou to the Bengaluru satellite centre for additional checks. The spacecraft was sent back in October 2018 for rescheduled launch. Due to the importance of the mission and the events surrounding the launch, it was highly covered by the media.
- PSLV-C37 mission launched Cartosat-2 series satellite and 103 co-passenger satellites on 15 February 2017. Out of the 104 satellites launched on a single rocket, 3 were from ISRO, 96 were from the USA and the other five were from Israel, Kazakhstan, The Netherlands, Switzerland and UAE. By successfully executing this mission, ISRO overcame Russia's record of launching 37 satellites at once in 2014. Dignitaries from all walks of life had congratulated ISRO on its feat and these were highly reported. The launch was hailed as a sign of India's emergence as a major player in the multibillion-dollar space market.
- Another important scientific mission launched was PSLV-C30/AstroSat – a dedicated astronomy mission. AstroSat launched on 28 September 2015 was a major scientific mission that helped setup a space observatory facilitating the study of the cosmological phenomenon. One of the unique features of the AstroSat mission was that it enabled the simultaneous multi-wavelength observations of various

astronomical objects with a single satellite. The mission contributed towards many significant cosmic observations based on which studies were conducted and research papers were published.

- Launched on 5 June 2017, GSLV MkIII-D1/GSAT-19 mission was the first developmental flight of GSLV MkIII. GSAT-19, a high throughput communication satellite, the payload in this mission, was the heaviest satellite launched from India till date. It was the first successful full flight of Mk III that would make India self-reliant in launching heavier satellites.
- GSLV-D6, the ninth flight of India's Geosynchronous Satellite Launch Vehicle (GSLV), launched GSAT-6 satellite on 27 August 2015. This was the first time a GSLV rocket with an indigenous Cryogenic Upper Stage had crossed the two-tonne payload mark. The launch earned GSLV Mk-II the tag of 'operational rocket'. GSAT-6, weighing 2117 kg, an advanced communication satellite, provided S-band communication services in the country.
- CARE mission launched on 18 December 2014, was the first experimental launch of a GSLV Mark III vehicle. The primary objective of the mission was to test the new design of the rocket, particularly at the time of lift-off and passage through the atmosphere. Its payload, an unmanned crew module was safely splashed down in the Bay of Bengal off the Andaman and Nicobar Islands after re-entry into the atmosphere. GSLV Mark III vehicle had the capacity to put into orbit satellites as heavy as 4 tonnes. With the success of the LVM-3/CARE mission, India was a step closer to realising its dream of sending humans into space.

Conclusion

For any government institution or organisation engaged in the programmes, activities and missions for societal applications, it is increasingly important that such programmes, activities and

missions are brought to the notice of the common public. The quantitative analysis of media coverage of space missions is important as it helps shape the public understanding of those missions.

ISRO as a research and development organisation plays a key role in the design and development of new technologies in the field of space science and technology. Since newspaper as mass media has huge reach especially among the rural masses, it is equally necessary that these missions, programmes and launches are covered and reported in newspapers also. Hence, to understand the coverage and reporting of ISRO launches, four popular English dailies of South India were selected for this study based on their subscription to ISRO HQ Library.

The retrieved news items were further categorised into different missions based on their applications. Based on the analysis of the retrieved news items it was observed that long-duration missions like Chandrayaan-2 and MOM had captured the imagination of general public from the very first stage of the mission i.e. the launch and had succeeded in sustaining interest in subsequent stages like orbit raising, orbit insertion, etc. Releasing data at regular intervals from these missions, such as never-before-seen images of the Moon and Mars and the expectations of new discoveries had maintained public curiosity.

The coverage data also reveals that planetary exploration missions seem to have attracted a great deal of public interest. In general, it was observed from the retrieved data that the more a mission succeeds in captivating the public interest, the more it was reported. Hence, the general observation from this study is that there is no uniformity in the number of news items covered and reported for the missions launched during the study period. However, the novelty of the missions helped in increased coverage and reporting.

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