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LESSONS LEARNT ABOUT PUBLIC INTEREST IN ANALOGUE TEST SITE MISSIONS

Volker Maiwald
German Aerospace Center (DLR), Institute of Space Systems, Department of System Analysis Space Segment, Bremen, Germany, Volker.Maiwald@dlr.de

During early 2013 the German Aerospace Center (DLR) participated in a simulated Mars mission at the Mars Desert Research Station (MDRS) in Utah, USA. The author has been a member of Crew 125, also known as the International Lunar Exploration Working Group's (ILEWG) EuroMoonMars B mission. While launching with a small article on DLR's website, the press attention for this mission grew significantly in the weeks after the simulated trip to Mars.

In this paper the media coverage of this research stay at MDRS is described and it is investigated how the apparent interest of the public in human spaceflight missions can and should be increased by improving awareness of analogue test site operations and missions and increasing the coverage of a human and emotional side rather than an exclusively technical point of view for such missions. The costs involved in EuroMoonMars B are related to the media outcome to show that for a humble investment, public interest can be triggered. The author describes further how enhancing analogue test site utilization helps increase public support and also is a legit way of justifying spendings on human missions to other planets. It is also suggested to involve the public more in comparable analogue missions to increase the understanding and support for human exploration efforts.

I. INTRODUCTION

The German Aerospace Center's (DLR) System Analysis Space Segment (SARA) department has been working on human spaceflight mission concepts since 2009 and has been conducting studies on planetary habitat designs since 2011 [1,2] with special expertise in the areas of space greenhouses [3].

Beginning with preparations in 2012, the department took part in its first analogue test site mission in February and March 2013. This mission was the EuroMoonMars B mission or Crew 125, headed by the International Lunar Exploration Working Group, at the Mars Desert Research Station (MDRS) in southern Utah, USA [4].

MDRS is as Mars analogue station, situated in the Utah desert and is crewed during each year's winter season by several crews for 2 week rotations. Crews have a size of usually 6 persons, the station itself has two main parts – the habitat and the greenhouse (s. Fig. 1). The centrepiece of the Mars mission simulation is the isolation and the scientific activity as well as processes.

Technology is not the prime factor, i.e. the habitat is e.g. not a full closed-cycle. However processes are conducted in observation of closed-cycle situations, e.g. egressing the habitat is only possible in simulated space suits and for exactly pre-planned and mission control approved extravehicular activities (EVAs). Furthermore resource conservation like power, bandwidth and especially water, create strict rules for living in the habitat (e.g. showering only every three days for 2 minutes).

The mission of Crew 125 [5] has had manifold objectives: geological surveys, technology and human factor experiments were conducted. The crew of six had a very diverse background in nationalities (Canada, Japan, Hungary, Netherlands and Germany) and professions alike (geologists, entrepreneur, engineers) and consisted of three women and three men.

MDRS' habitat has two floors, the lower floor with workshop, two airlocks, storage room for EVA equipment as well as sanitary installations. The upper floor consists of the working area, kitchen and private bunk rooms.

During the mission three media teams visited the station as well, to conduct interviews and photograph parts of the mission. With the beginning of the mission, the German Aerospace Center also launched [6] a media campaign, consisting of content for web, printed and broadcast media. A view on the depth of this campaign, the ability to reach the general public and repercussions

Table 1: Media distribution over time and media type. Marked with * is biased as only national entries are considered.

Time (month)	Web	Newspaper/ Magazine*	Radio*	TV*
February 2013	**17**	**10**	0	0
March 2013	**174**	**9**	**13**	**2**
April 2013	**33**	**4**	**2**	**3**
May 2013	**10**	**2**	0	**2**
June 2013	0	0	**1**	0
July 2013	**1**	0	0	0
August 2013	**4**	0	0	0
September 2013	**3**	0	0	0
October 2013	0	0	0	0
November 2013	**2**	0	0	0
December 2013	**21**	0	0	0
All over 2014	**4**	**2**	0	**1**
Sum	269	27	16	8

Figure 1: MDRS' two main parts: the Habitat and Greenhouse.

on planning of future media campaigns and exploits for human exploration of space are described in this paper.

II. MEDIA CAMPAIGN ABOUT EUROMOONMARS B

DLR's initial content about its participation in EuroMoonMars B has been a press release [6] at the beginning of the mission (February 2013), which was followed by several interviews for printed and broadcast media and news agencies. Table 1 summarizes these releases, distributed over time and media type: web distribution, print media and broadcast in TV or radio. It shall be noted that media categories besides web mostly include only national content, which has been known to the author. Web content includes all mentions of the mission as provided by a web search. This is therefore an incomplete view.

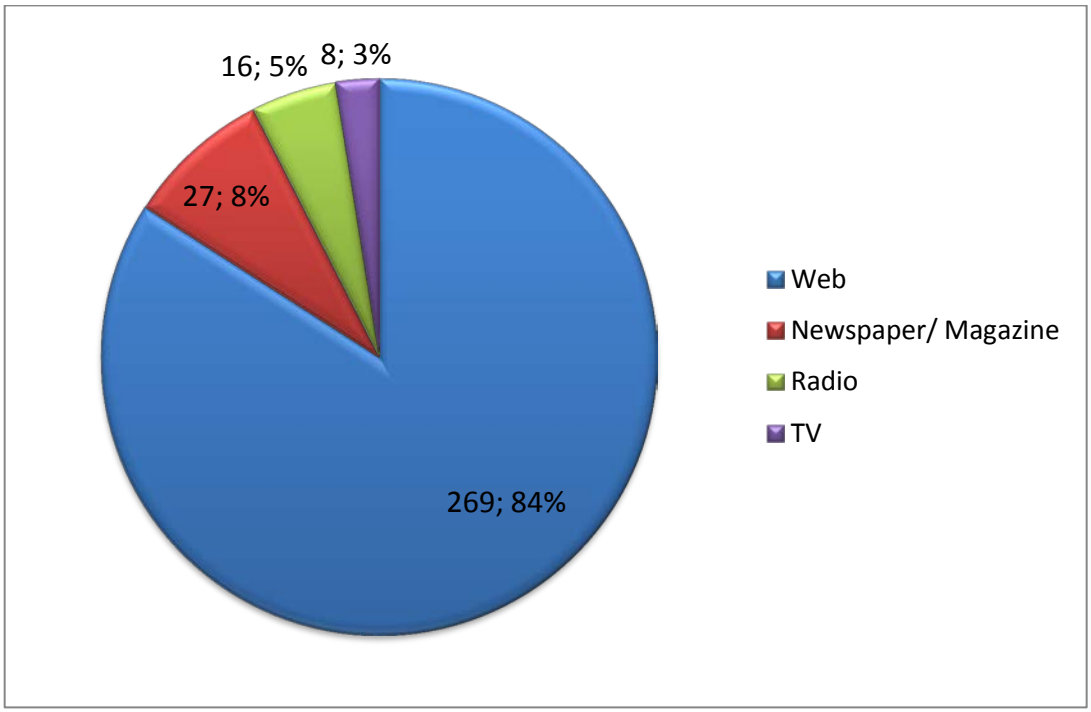

Figure 2: Percentage and absolute values of media distribution.

I.I Media Presence over Time

As can be seen in Table 1, the largest amount of media presence occured directly in the aftermath of the mission, i.e. March 2013. First simple media types as web and printed media prevailed, the media coverage was picked up by radio and TV broadcasts. The latter consisted of TV interviews in local, regional and nation-wide broadcasts, or TV documentaries about the activities of DLR regarding human exploration of Mars.

Later web-based coverages in the summer months July, August and September include mainly Arabic and Asian reports about EuroMoonMars B, which is understandable given the delayed transfer from the information into these regions due to language and political barriers.

There has been another spike in the later part of the year, which has been the distribution of a "best-of" of year 2013 pictures on the web and one picture of EuroMoonMars B was among them. The TV entry for 2014 has its origin in similar circumstances – in this case the 500th broadcast of the respective TV show (starting in 2000) led to a best-of and the interview about MDRS was part of the four entries for this.

The 2014 entries of the other media are of similar nature or are short mentionings of EuroMoonMars B when covering the work of SARA in general.

Rather "exotic" media to cover the simulated Mars mission of MDRS Crew 125 have been a student web-radio broadcast, an insurance magazine, reporting about extreme undertakings, and a pc-game magazine.

Likely due to the good ratio of effort and potential audience size most of the content registered for this paper has been web based as can be seen in Fig. 2. In total 84% of the entries have been web content, blog entries, articles for online magazines or online versions of newspapers. Printed media have the second largest proportion but are in general only 10% of the web content. Radio and TV broadcasts naturally have the smallest part in the media coverage, due to the extent of effort and costs involved for the corresponding media, this is to be expected. Furthermore it needs to be mentioned that this registering of content is biased as the author has few means to check if there has been media coverage in other nations aside from web content. Two TV broadcasts have been made about the simulated mission however in international TV.

I.II Personal Interest

Besides mere media coverage the author also made the experience that a large number of personal inquiries have been directed at him from unknown strangers via various encounters, social networks like Facebook or even during questionnaire rounds at job trade fairs with students. Generally there has been a measurable amount of interest in the idea of a simulated Mars mission.

III. DISCUSSION

III.I World-wide Distribution

The world-wide distribution has been very extensive, when concerning the web-content. Content about EuroMoonMars B was present in the USA, all over Europe, Canada, Japan, Russia, India, China, Vietnam, Israel, Thailand, Turkey, but also more remote countries (at least ideologically or politically) like Iran or Azerbycan.

The last web entries have been reports about the mission from Iran and Vietnam, which is to be expected as the media can be considered more remote in these countries due to language and political barriers.

III.II State of Public Information and Critisim

A number of comments in web content have been rather critical, some even addressing that this simulated Mars mission was in fact part of a conspiracy – twofold: Some comments referred to Utah's desert as the place where e.g. actual Mars missions are "recorded" to misinform the public. Others misunderstood the reports as attempt to lead the public to believe an actual Mars mission has been going on and exclaimed the errors (e.g. plant life visible in pictures).

Other, apparently more informed persons, partly with scientific background, questioning the reasonability of the mission, e.g. because environmental conditions are different than on Mars, disregarding that exact environmental conditions are not necessary for e.g. testing effects of isolation or the suitability of the terrain for geological reasons.

Both shows that more information should be given and education on space, space exploration and the technology behind it as well as the science need to be extended. The fact that people believe in conspiracy theories over scientific procedures means the latter have not been explained thoroughly enough.

Criticism on the applicability of e.g. analogue missions can be encountered by elaborating more which aspects are to be tested and why the conditions in the given analogue test site are sufficient for that. However it should also be made clear that there are different depths of scientific reporting and an internet article is not sufficient to explain all scientific and technical details or justifications. Having accompanying papers or reports ready and linking articles for the general public to them, might help to appease criticism of more professional kind.

Besides that, feedback tended to be positive and enthusiastic of human crewed missions and preparatory steps towards them. Certain questions, e.g. is human living possible on Mars, what does Mars look like, show that the general information about our neighbor planet could be improved, possibly through education in schools, universities or media.

III.III Emotional Investment

Questions during interviews and also during personal inquiries mostly concerned the human part of the mission, i.e. the living conditions, restrictions regarding water usage, small quarters and how it feels to be in isolation from the outside, especially with strangers. The popularity of the pictures, especially of the landscape shows that the audience is emotionally invested in the idea of human exploration. This popularity continued even many months after the missions end, so far that it became part of many year best-ofs.

III.IV Success Ratio

Regarding costs EuroMoonMars B can be considered to have been very efficient. It has been present for months in a large amount of media, including nationwide TV in a show very popular in Germany. There has been large attention also in printed media in a time span of four months, the presence was even far more extended for web content and some of the presence even carried over to the next year. The effort to reach this has been moderate. The costs for the missions as such have been about 1,500 Euros for travelling, equipment and stay at MDRS and the mission required two weeks of personnel time, which has been allocated in conducting mission relevant tasks (e.g. Engineering), review aspects of technology maturity and habitat design as well, generally gaining experience that is now used in other projects. As the purpose of the mission has not been media attention, of a technical and scientific nature, and the mission purpose has been fulfilled, it is conservative to accommodate the effort for the mission also as effort for the media campaign. Further effort has been the actual time spent on conducting interviews, travelling to e.g. TV shows and so forth. This is estimated two weeks of full time work.

Adding conservatively together all costs, this would lead to an amount of approximately 15,000 Euros (including the costs for the mission itself), which resulted in a very wide media attention over several month. Only counting printed and broadcast media, this would result in costs of 300 Euros per media item, which can be considered a modest price. The TV shows alone reached more than 1 million people of audience.

Figure 3: The desert of Utah near MDRS in early 2013.

IV. FUTURE CAMPAIGNS AND HUMAN MISSIONS

Analogue test site missions have the advantage of being emotionally more accessible for the general audience than reals space missions. While traveling to Mars is an abstract thought for most people, spending time in the desert of Utah is less extreme, as most people have a good image of what a desert looks like (s. Fig. 3).

The interest in this kind of endeavour can and should be exploited in future campaigns to reach the following goals:

- Report on spendings of e.g. tax payer money to the general public,
- educate the general public about human exploration and space in general, including living in space and about the space environment,
- create support for human exploration missions,
- inspire interest in scientific and technical space careers in young people.

It has also been shown that the most common questions have been regarding the living conditions within the human habitat, therefore a media campaign could actually include, purposefully, coverage of activities – e.g. as preparation of food, possibly including recipes for "space food" at home, growing of plants in the isolated environment, living with reduced impact and under conservation of resources (e.g. water), which is also relevant for a sustained environmentally friendly living on Earth.

Especially due to the fact that the majority of questions has been repetitive, a directed press conference would reduce the effort by having one large interview session instead of several smaller ones.

The media response about EuroMoonMars B was unexpected and therefore reaction to that was not planned. Careful planning could extend the effectiveness and quality of the media campaign, by e.g. addressing various levels of education or depths of information, i.e. making purposeful campaigns for high school students, university students, and the general public. Offering means of participation, e.g. by simple experiments, crowdsourcing elements, mapping activities and incorporate e.g. feedback of the public into the mission, could increase media effectiveness. Contests could be held to incorporate the public, prizes could be e.g. naming geological sites or station parts after winners. A similar strategy could be followed for crowdfunding endeavours.

During EuroMoonMars B the publication of reports about the mission has been delayed due to mission control necessities, it is advisable to increase the amount of quickly released information, however, to keep the public interested and allow the public to connect to crew members. Reasonable means to achieve that would be weblogs, a youtube channel or email newsletters. Experiment progress, crew faring and so on could be reported using these means, and increase the immersion of the public into the mission.

V. CONCLUSION

The Mars analogue mission EuroMoonMars B, conducted by a multinational team in early 2013, has been followed by an extensive media attention including web articles, printed and broadcast media content. The response has been international and interested mostly in the human part of the mission. Costs have been modest at about 300 Euros per media item, addressing more than one million people in one TV show. Future analogue test site missions could be planned in the beginning regarding media outreach helping to educate and inform the general public.

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