Functional Requirements Document

For

Margadarshak: Scheduling Portal

V 2.0

ISTRAC

ISRO, Bengaluru

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1. Introduction

This Functional Requirements Document is for Scheduling Portal which shall allow the users like controllers, Space-craft Operations Managers, Operations Directors, scheduling operators etc to view the general schedule file for all supported space-crafts and stations through web-based browser. This software shall allow filter-based viewing of schedule. It shall also allow the users to perform schedule update within the scheduled timings and place requests for extra support requirements.

1.1. Purpose

General schedule file is used by many entities within ISTRAC. Presently, general schedule file is a large text file containing all supported as well as visible passes of ISTRAC supported space-crafts over all ISTRAC and External network stations. Viewing required satellite or station schedule from such a large file would be cumbersome for the user. This demands for an application to allow the users to view the desired schedule in a selective fashion and enabling such provision using a web-based browser would allow usage by a larger section of internal users. Moreover, web-based application can be further extended for cross-support requirements of external users as well.

Currently, change in pass requirement or extra support requirement is initiated by a mail from controllers/SOM/OD followed by a manual process to update and release the changed schedule to all concerned users. This software shall also minimize this process by allowing the user to effect such changes in pass schedule through the portal.

1.2. Scope

Scheduling Portal will allow users to have a selective view of the schedule with desired satellite, station, elevation, timings, etc. It will also allow controllers to view clashing passes for a selected pass which would allow them to make an informed decision before requesting extra support over any station. Eventually, any change/addition in scheduling requirements shall be allowed to be done by the user using the portal.

This application will be available to all users with access to ISTRAC Mission network, ISTRAC campus network and Internet.

1.3. Definitions, Acronyms & Abbreviations

SOM: Space-craft Operations Manager

ISTRAC: ISRO Telemetry, Tracking & Command Network

OD: Operations Director

1.4. References

2. Functional Requirements

The software shall read the general schedule file.

No.	Requirement Name/Category	Requirement ID	Requirement Details/Description
1.	**General Requirements**	SchPortal_001.01	Individual user login feature shall be provided.
		SchPortal_001.02	Every user shall be role based. Roles can be Controller/OD/SOM/Scheduling Operator etc. Users, roles and authorized functions shall be well defined and discussed under FRD review committee.
		SchPortal_001.03	The portal shall be available for access to all the ISTRAC/ISRO users on Intranet with proper authentication.
		SchPortal_001.04	Portal shall log all the user actions and updates that happened and support analysis of any issues that occur.
		SchPortal_001.05	All precautions shall be taken in the portal to ensure that the mission network operations are not disturbed in any way.
		SchPortal_001.06	Portal shall always work with the latest schedule.
		SchPortal_001.07	Portal shall authenticate the users from ISTRAC's AD/IDP for providing access to the website.
		SchPortal_001.08	FTS health shall be displayed.
		SchPortal_001.09	Current time in UT/IST shall be displayed to the user.
2.	**Schedule Viewing Requirements**	SchPortal_002.01	It shall allow the user to view the existing schedule for all space-craft.
		SchPortal_002.02	By default, the on-going passes shall be highlighted to the user.
		SchPortal_002.03	It shall show the elapsed, on-going and future passes in different colours.
		SchPortal_002.04	Portal shall have the provision to indicate the categories which may have commercial implication like Emergency or Regular whenever external agency support is involved.
		SchPortal_002.05	It shall have the provision for selective viewing of schedule based on the following parameters:

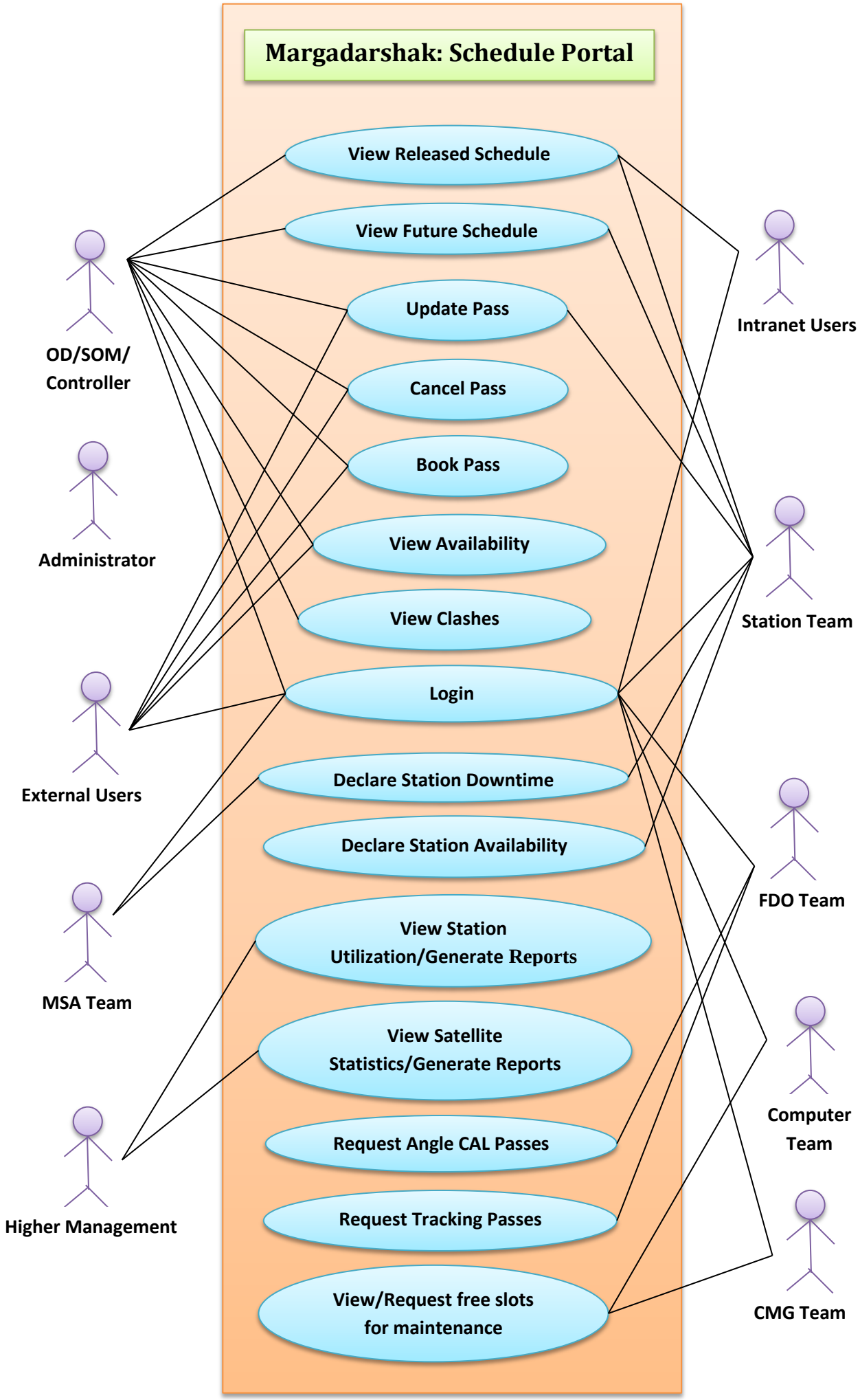
			(a) Satellite (b) Station (c) Minimum Elevation (d) Maximum Elevation (e) Operation (f) Start Time in a day (g) End time in a day (h) Duration (I) Orbit number (j) Exclusive Combination of Operations (k) Inclusive Combination of Operation (l) External/Internal Agency (m) LCK ASCC Satellites (n) BLR Control Center Satellites (o) DSCC Satellites
		SchPortal_002.06	It shall have the provision to apply a combination of the parameters for viewing.
		SchPortal_002.07	Countdown for selected pass shall be shown to the user.
		SchPortal_002.08	Plots representing the schedule graphically shall be included in the portal.
		SchPortal_002.09	Complete tracking of changes for a pass over the week shall be displayed to the user on request. Also, user shall be able to set a flag to notify the user for changes.
		SchPortal_002.10	It shall show the last updated time for schedule.
3.	**Pass Update Requirements for Controllers/Stations**	SchPortal_003.01	It shall allow the users to change the operations for a scheduled pass to allowed operations or their combination.
		SchPortal_003.02	It shall allow the user to cancel a scheduled pass.
		SchPortal_003.03	It shall allow the user to update the AOS/LOS of a scheduled pass within the allotted timings.
		SchPortal_003.04	It shall allow the user to change the terminal for a supported pass to other allowed co-located terminal/s if available.
		SchPortal_003.05	Certain attributes of the pass shall be secured from user editing. For example, orbit no. , elevation, etc.
		SchPortal_003.06	It shall block the users from updating/cancelling/booking passes within portal's service latency.
		SchPortal_003.07	It shall allow user to update post-facto

			information about extra passes taken.
		SchPortal_003.08	It shall also allow the user to cancel an already placed request.
4.	**Pass Booking over ISTRAC Stations**	SchPortal_004.01	It shall indicate the available passes over all available terminals for a satellite while booking passes.
		SchPortal_004.02	It shall allow the users to book an available pass.
		SchPortal_004.03	It shall also indicate the unavailable and unscheduled passes for a satellite while booking so as to request passes during emergency/special operations.
		SchPortal_004.04	For an unavailable pass, it shall display the clashing passes upon selection.
		SchPortal_004.05	It shall show the possibility of supporting the required unavailable pass with some curtail/delay of the visible timings of required pass.
		SchPortal_004.06	For unavailable passes, it shall also show the different possibilities for clash resolution and pass allotment over other allowed terminals.
		SchPortal_004.07	It shall allow the user to choose one of the displayed possibilities for clash resolution in order to notify clashing s/c user to alter clashing s/c schedule for accommodating the pass requirement.
		SchPortal_004.08	It shall notify the user once the pass required by the user is allotted.
		SchPortal_004.09	It shall notify the s/c controllers/SOM/OD for any further updates to corresponding s/c schedule after release.
		SchPortal_004.10	It shall allow all the users to view the status of the pass requests placed by any user.
		SchPortal_004.11	It shall allow authorized internal users to book external satellite (like ADRAS-J, Amazonia) support over ISRO stations.
		SchPortal_004.12	Portal shall notify the user of any visibility changes for the requested pass.
		SchPortal_004.13	It shall warn the user for pass request which overrides the general guidelines for the given satellite. Overriding shall be allowed in certain cases only like max. elevation

			constraint, min. duration constraint etc.
5.	**Pass Booking over External Agency Stations**	SchPortal_005.01	S/w shall allow users to book passes over an external agency station.
		SchPortal_005.02	S/w shall allow users to update only operation field for a booked pass over an external agency station.
		SchPortal_005.03	S/w shall not allow the users to cancel passes over an external agency station.
		SchPortal_005.04	Pass request shall be placed to external agency periodically.
		SchPortal_005.05	Portal shall honour a pass request/update within a defined service interval only beyond which no operation shall be allowed by the user.
		SchPortal_005.06	Users shall be notified once the pass is booked over external agency.
		SchPortal_005.07	It shall periodically notify the users on inability to service a pass request in case of non-reception of the confirmation from external agency within the service time.
		SchPortal_005.08	Portal shall notify the users about the passes which cannot be serviced through the portal due to insufficient processing time. In such cases, users can avail the pass by directly calling the station.
6.	**Interface for Future Schedule**	SchPortal_006.01	S/w shall allow the user to view the upcoming week/s tentative schedule if available for the purpose of planning special operations.
		SchPortal_006.02	It shall allow the users to place update/booking/cancel requests for next week.
7.	**Interface for External Users**	SchPortal_007.01	S/w shall have the provision to be extended to external users in future.
8.	**Data Analysis & Statistics for Management**	SchPortal_008.01	It shall allow users in higher management to view the station utilization statistics for any given station.
		SchPortal_008.02	It shall allow users in higher management to view the scheduling statistics for any given satellite.

		SchPortal_008.03	It shall allow user to generate reports.
9.	**Station requirements**	SchPortal_009.01	It shall allow station team to specify about downtime over a station due to maintenance, natural calamity, equipment issues at station, etc.
		SchPortal_009.02	It shall allow the station team to specify the availability of station for support.
		SchPortal_009.03	It shall allow the station team to specify cool-off timings for individual stations during simulations and pre-launch phase.
10.	**FDO requirements**	SchPortal_010.01	It shall allow the FDO team to request for angle calibration passes for a given satellite over given terminals.
		SchPortal_010.02	It shall allow FDO team to request for tracking data collection for a given satellite over a given terminal.
11.	**CSSG/CMG requirements**	SchPortal_011.01	It shall allow the network/computer/CMG-Electrical team to view free slots with respect to the control centre for maintenance purpose.
		SchPortal_011.02	It shall allow the network/computer/CMG-Electrical team to place requests for slots for maintenance purpose.
12.	**MSA requirement**	SchPortal_012.01	It shall allow MSA team to book/modify/cancel station maintenance slots.
13.	**Admin Requirements**	SchPortal_013.01	It shall allow the admin user to perform certain scheduling activities through the portal like report generation, etc.
		SchPortal_013.02	Any maintenance activity on the portal shall be notified to the users in advance through the portal itself.
14.	**Security Requirements**	SchPortal_014.01	All requests shall be encrypted before posting to server.
		SchPortal_014.02	Portal shall obtain security clearance from the concerned security team at ISTRAC before it is hosted in campusnet.
15.	**Simulation Requirements**	SchPortal_015.01	Portal shall allow the user to interface with schedule team for scheduling requirements during pre-launch simulations for a satellite. Elaborate requirements to be worked out.

3. Use Case Diagram


Margadarshak: Schedule Portal
View Released Schedule
View Future Schedule
Update Pass
Cancel Pass
Book Pass
View Availability
View Clashes
Login
Declare Station Downtime
Declare Station Availability
View Station Utilization/Generate Reports
View Satellite Statistics/Generate Reports
Request Angle CAL Passes
Request Tracking Passes
View/Request free slots for maintenance
OD/SOM/ Controller
Administrator
External Users
MSA Team
Higher Management
Intranet Users
Station Team
FDO Team
Computer Team
CMG Team