

Requirements Document for
состаюк – Sostanok

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Glossary

Application programming interface The application programming interface describes how to interact with a system. The interface provides methods which can be accessed from outside the system. 30

Flexdock Flexdock is the name of a framework where subwindows can be dragged freely. 31

garbage collection Garbage collection is a routine to search unused files and data sets. Found files will be deleted. 20

GUI Graphical User Interface. 12

Hyper Text Markup Language 5 HTML 5 is a markup language which is used for structuring and presenting content for the World Wide Web. 22

Hypertext Transfer Protocol Secure Hypertext Transfer Protocol Secure (HTTPS) is a communications protocol for secure communication over a computer network, with especially wide deployment on the Internet. Technically, it is not a protocol in and of itself; rather, it is the result of simply layering the Hypertext Transfer Protocol (HTTP) on top of the SSL/TLS protocol, thus adding the security capabilities of SSL/TLS to standard HTTP communications. (source: en.wikipedia.org: 11.11.2013). 21

Interactive Connectivity Establishment Interactive Connectivity Establishment (ICE) is a technique to establish connections with clients behind a router or firewall. 32

JavaScript JavaScript is an interpreted computer programming language. As part of web browsers, implementations allow client-side scripts to interact with the user, control the browser, communicate asynchronously, and alter the document content that is displayed. It has also become common in server-side programming, game development, and the creation of desktop applications. (source: en.wikipedia.org : 11.11.2013). 22

Plugins A plugin is an extension to any sort of software that adds additional features or alters existing ones. 11, 13

recordable plugin These are plugins which can be recorded. In case of start the recording of such a plugin the plugin starts to record himself from this moment on in a separately file on the server. 26

session A session consists of everything which belongs to one concrete conference. 13

webRTC WebRTC is a free, open project that enables web browsers with real-time communications (RTC) capabilities via simple Javascript APIs. The WebRTC components have been optimized to best serve this purpose. WebRTC also uses HTML 5. (source: <http://www.webrtc.org/>; 11.11.2013). 25

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Part I

User Requirements

0.0.0.0.1 UR001

Statement *The system shall give the opportunity of a video, voice and chat communication between two or more users. Furthermore, it shall be possible to mix these features (e.g., the user can communicate via voice and video at the same time).*

Priority *A*

0.0.0.0.2 UR002

Statement *Communications such as described in UR001 have at least two members. Since in most of the cases there are many more users, the system shall give the possibility to mute some members of the communication.*

Priority *A*

0.0.0.0.3 UR003

Statement *The system shall give the possibility to share files with other users during or outside a session. It shall be possible to share files with registered users and with users outside the system.*

Priority *A*

0.0.0.0.4 UR004

Statement *The system shall be extensible via Plugins.*

Priority *A*

0.0.0.0.5 UR005

Statement *The following plugins shall be available: Conference Tool, WEKA, Games and OpenTox.*

Priority *B*

0.0.0.0.6 UR006

Statement *A feature available for users is sharing the screen of the browser with other users. However, this is restricted to transmitting the screen.*

Priority *A*

0.0.0.0.7 UR007

Statement *It shall be possible to share documents with others and to work together on these documents without to block another user. More precisely, it shall be possible to create and edit text files and annotate/highlight PDF files.*

Priority *B*

0.0.0.0.8 UR008

Statement *Users can register themselves to the system. After this the user automatically gets access to the system.*

Priority *A*

0.0.0.0.9 UR009

Statement *It shall be possible to record conferences, which means that every recordable Plugin is recorded and can be accessed separately. But other users have to give their permission that everything is conform to German law.*

Priority *A*

0.0.0.0.10 UR010

Statement *A feature of the system shall be the digital whiteboard on which users can write and draw simple geometric objects like lines and circles. It shall be possible to use the whiteboard alone or share it with other users. Overall the whiteboard can be added to a communication, so that members of the communication can see what is going on or can work together on it. In which form the whiteboard will be included in a communication is up to the member who added the whiteboard to the communication.*

Priority *A*

0.0.0.0.11 UR011

Statement *The system shall give every user an address book with which they can manage their contacts in groups. It also has to allow inviting individual users or groups of users to sessions.*

Priority *A*

0.0.0.0.12 UR012

Statement *The GUI shall be organized in a multi-window view with the opportunity to customize the size and location of windows.*

Priority *A*

0.0.0.0.13 UR013

Statement *It shall be possible to have more than one and up to a limited number of session at the same time. The upper limit depends on the users' internet-connections and the server capacity (in case of using the server).*

Priority *A*

0.0.0.0.14 UR014

Statement *It shall be possible to activate multiple Plugins at the same time.*

Priority *A*

0.0.0.0.15 UR015

Statement *Every Plugin can have its own window inside the multi window view.*

Priority *A*

0.0.0.0.16 UR016

Statement *Users shall have the possibiltiy to personalize their theme. A theme includes: background colour, font, font-size and font-color.*

Priority *B*

0.0.0.0.17 UR017

Statement *The system shall be accessible from all over the world.*

Priority *A*

0.0.0.0.18 UR018

Statement *The application shall run in all major Browsers (Desktop and Mobile): Firefox, Chrome, Opera*

Priority *A*

0.0.0.0.19 UR019

Statement *The application runs out of the box. User shall not have to download anything except for a browser before they can use the application.*

Priority *A*

0.0.0.0.20 UR020

Statement *The system shall support registered and unregistered users. Registered users shall be able to store their settings made at previous logins. Unregistered user always start with default settings. Changes they made are only valid for their current session.*

Priority *A*

0.0.0.0.21 UR021

Statement *Every registered user can choose whether he/she can be recorded or not. For an unregistered user this option shall be set to no recordings.*

Priority *A*

0.0.0.0.22 UR022

Statement *The application shall run on Micha's cellphone (an unsmart smart-phone).*

Priority *A*

0.0.0.0.23 UR023

Statement *For every plugin, the user initiating the session shall have the opportunity to give or withdraw rights to other users.*

Priority *A*

0.0.0.0.24 UR024

Statement *The Application shall be usable on smartphones without installing an app.*

Priority *A*

0.0.0.0.25 UR025

Statement *Using the system shall be free for everyone.*

Priority *A*

0.0.0.0.26 UR026

Statement *The connection between users and the system shall be encrypted.*

Priority *A*

0.0.0.0.27 UR027

Statement *The system shall provide the functionality to store and restore a session at any time.*

Priority *A*

0.0.0.0.28 UR028

Statement *Every plugin of the system can be used in every session.*

Priority *A*

0.0.0.0.29 UR029

Statement *The system shall provide an admin view for maintainance.*

Priority *A*

0.0.0.0.30 UR030

Statement *The system shall make weekly backups.*

Priority *A*

0.0.0.0.31 UR031

Statement *Every user registered or not can invite other people to join their conference.*

Priority *A*

0.0.0.0.32 UR032

Statement *In every conference, there are a few users, at least one, who is the moderator. The moderator can add other members, distribute rights, and kick members.*

Priority *A*

Part II

System Requirements

Chapter 1

Non-Functional Requirements

1.1 Product Requirements

1.1.1 Usability Requirements

1.1.1.0.1 NFR001

Statement *After watching a short (5 minutes) video introduction about the main features (create sessions, add plugins to a session, add members to a session, share files inside and outside of sessions, functions of whiteboard, record plugins) of the system, users should be able to use the main features of this software.*

Priority *A*

1.1.1.0.2 NFR002

Statement *The system can be accessed and used if there is an internet connection. There are no restrictions regarding firewalls and routers.*

Priority *A*

1.1.1.0.3 NFR003

Statement *The application should be usable for the following browsers: Firefox X, Opera Y, Chrome Z.*

Priority *A*

1.1.1.0.4 NFR004

Statement *The system language is English.*

Priority *A*

1.1.2 Efficiency Requirements

1.1.2.1 Performance Requirements

1.1.2.1.1 NFR005

Statement *The quality of video broadcast shall adjust to the users internet connection.*

Priority *A*

1.1.2.1.2 NFR006

Statement *The minimal system requirements for the server are as follows: i7 CPU with 8GB Ram, 2 TB storage, and a Linux operating system.*

Priority *A*

1.1.2.1.3 NFR007

Statement *The interaction between the conference participants shall be in real-time.*

Priority *A*

1.1.2.2 Space Requirements

1.1.2.2.1 NFR008

Statement *A recording file is split after the file has reached a size of 1 GB.*

Priority *A*

1.1.2.2.2 NFR009

Statement *Sessions shall be deleted after an inactive time of 5 hours.*

Priority *A*

1.1.2.2.3 NFR010

Statement *Once a day garbage collection is triggerd to search expired guest accounts, session recordings, and shared files.*

Expired files are defined as followed:

guest accounts After 24 hours.

session recordings After 2 weeks.

shared files After 2 weeks (depends on length of session recordings).

Priority *A*

1.1.2.2.4 NFR011

Statement *Files shared via file sharing are limited to 1 GB.*

Priority *A*

1.1.3 Dependability Requirements

1.1.3.0.1 NFR012

Statement *If the system crashes, the system shall try to reboot automatically and inform the administrator.*

Priority *A*

1.1.3.0.2 NFR013

Statement *Backups of stored data (session recordings, shared files, user accounts) shall be done daily and stored on a different server.*

Priority *A*

1.1.3.0.3 NFR014

Statement *The system shall be available 24/7.*

Priority *A*

1.1.3.0.4 NFR015

Statement *The number of system crashes in a month shall be less than one.*

Priority *A*

1.1.3.0.5 NFR016

Statement *There is no need to stop the application to perform a backup.*

Priority *A*

1.1.4 Security Requirements

1.1.4.0.1 NFR017

Statement *Data transfer to and from the server must be performed via an Hypertext Transfer Protocol Secure connection.*

Priority *A*

1.1.4.0.2 NFR018

Statement *Peer-to-Peer communication shall be encrypted with a hybrid encryption algorithm.*

Priority *A*

1.1.4.0.3 NFR019

Statement *The invitation URL for guests shall only be usable once.*

Priority *A*

1.1.4.0.4 NFR020

Statement *Passwords are stored on the server in text/plain, but hashed with a random seed.*

Priority *A*

1.1.4.0.5 NFR021

Statement *All data (shared data and session recordings) is stored unencrypted on the server.*

Priority *A*

1.2 Organisational Requirements

1.2.1 Environmental Requirements

1.2.2 Operational Requirements

1.2.3 Development Requirements

1.2.3.0.1 NFR023

Statement *The software shall be valid Hyper Text Markup Language 5 and JavaScript.*

Priority *A*

1.3 External Requirements

1.3.1 Regulatory Requirements

1.3.1.0.1 NFR024

Statement *The system is published under the GPL Version 3.*

Priority *A*

1.3.2 Ethical Requirements

1.3.2.0.1 NFR025

Statement *Development process stands under IEEE standards of ethical development.*

Priority *A*

1.3.3 Legislative Requirements

1.3.3.1 Accounting Requirements

1.3.3.2 Safety / Security Requirements

1.3.3.2.1 NFR026

Statement *The system respects German law.*

Priority *A*

1.3.3.2.2 NFR027

Statement *Storing data of members shall be conform the German data legislations.*

Priority *A*

Chapter 2

Functional Requirements

2.0.0.0.1 FR001

Statement *The system makes use of webRTC to provide the video, voice and text communication. (see user requirement UR001)*

Priority *A*

2.0.0.0.2 FR002

Statement *When having a conference and one user clicks on another users name, a context menu appears where the user can select either whisper or mute someone. (see user requirement UR002)*

Priority *A*

2.0.0.0.3 FR003

Statement *The system allows to upload files in sessions and the user can set restrictions to visibility to other users. (see user requirement UR003)*

Priority *A*

2.0.0.0.4 FR004

Statement *Only authors of uploaded files, moderators or administrators can delete them. (see user requirement UR003)*

Priority *A*

2.0.0.0.5 FR005

Statement *The system allows to upload files out of sessions and the user can set restrictions to visibility to other users. The system generates a unique identifier (URI) under which other users can reach the file. (see user requirement UR003)*

Priority A

2.0.0.0.6 FR006

Statement *The system is designed such that can adopt well defined plugins. (see user requirement UR004)*

Priority A

2.0.0.0.7 FR007

Statement *One Plugin is the conference tool. This plugin gives the possibility to handle a big conference such a lecture with the system. Therefore different views are necessary. A conference needs an audience which sees the speaker, a schedule of the conference and the slides on the screen. They can also show the speaker that there is an question. The speaker has another view. He can see how many time left and which slides comes next. Furthermore a view for an conference designer is useful. He can see a plan of the whole conference, the current activities and can edit the schedule. At least a view for the presentation manager is used. He decides which part of presentation the audience can see. Just the slides or slides and speaker or additional information which he can add. The system shall also give the opportunity that an audience out of the conference romm can see the presentation. (see user requirement UR005)*

Priority B

2.0.0.0.8 FR008

Statement *The system must give the opportunity of user-registration via e-mail-address, username, and password. (see user requirement UR008)*

Priority A

2.0.0.0.9 FR009

Statement *The system shall give the possibility to record recordable plugin while sessions. Therefore the user can select which plugins in a session he wants to record. (see user requirement UR009)*

Priority A

2.0.0.0.10 FR010

Statement *Every registered user can choose whether he/she can be recorded or not. For an unregistrered user this option shall be set to no recordings. (see user requirement UR021)*

Priority A

2.0.0.0.11 FR011

Statement *The system denies the recording of a plugin if in the session is a user who forbids the recording (see user requirement UR021)*

Priority *A*

2.0.0.0.12 FR012

Statement *The systems stores records of differnt plugins in several files. (see user requirement UR009)*

Priority *A*

2.0.0.0.13 FR013

Statement *For an whiteboard recording the system stores every step by drawing - not only the end-result. (see user requirement UR009)*

Priority *A*

2.0.0.0.14 FR014

Statement *For an text chat the chat history will be stored as plain/text since the recording started. (see user requirement UR009)*

Priority *A*

2.0.0.0.15 FR015

Statement *For a video recording a video file will be saved since the recording is started. (see user requirement UR009)*

Priority *A*

2.0.0.0.16 FR016

Statement *For a audio recording the audio file will be saved since the recording started. (see user requirement UR009)*

Priority *A*

2.0.0.0.17 FR017

Statement *The system have to include the plugin of a digital whiteboard on which users can draw geometrical objects or write text. They can use it on their own or in sessions. (see user requirement UR010)*

Priority *A*

2.0.0.0.18 FR018

Statement *The system have to give the opportunity to include a whiteboard to a session, that other users in the session can hava a look at the whiteboard or edit the whiteboard too. (see user requirement UR010)*

Priority *A*

2.0.0.0.19 FR019

Statement *By including the whiteboard to a session the user has to decide whether the members of the session can only see the whiteboard or even edit things. (see user requirement UR010)*

Priority *A*

2.0.0.0.20 FR020

Statement *The system shall give a user the possibility to have more than one session. (see user requirement UR013)*

Priority *A*

2.0.0.0.21 FR021

Statement *The system denies a new session if with a new session the quality of the other sessions falls under a well defined value. For video chat this border lies by X kB and by voice chat by Y kB. (see user requirement UR013)*

Priority *A*

2.0.0.0.22 FR022

Statement *The system devides between three different arts of plugins. The first are high traffic plugins, the secont are medium traffic plugins and the third are less traffic plugins. So the system gives 10 percent of speed to the less traffic plugins, 30 percent to the medium traffic plugins, and 60 percent of speed to the high traffic plugins. (see user requirement UR013)*

Priority *A*

2.0.0.0.23 FR023

Statement *Every plugin can be marked (but only one at a time) as priorised, so that this plugin gets the most speed of the internet connection and the other plugins only gets the minimal value. (see user requirement UR013)*

Priority *A*

2.0.0.0.24 FR024

Statement *The system can deny new session who run over the server or a file upload if he has overload. (see user requirement UR013)*

Priority *A*

2.0.0.0.25 FR025

Statement *In a session a user can include a arbitrary number of plugins at the same time. (see user requirement UR014)*

Priority *A*

2.0.0.0.26 FR026

Statement *The system have to give the possibillity to add every plugin to a session. (see user requirement UR028)*

Priority *A*

2.0.0.0.27 FR027

Statement *The User has the possibility to include every opened dock on his flex dock in a session. (see user requirement UR012, UR014)*

Priority *A*

2.0.0.0.28 FR028

Statement *Every Plugin can have its own window inside the multi window view. (see user requirement UR015)*

Priority *A*

2.0.0.0.29 FR029

Statement *Sessions or even parts of sessions (Plugins that are storable) can be stored and reloaded from the session admin. (see user requirement UR027)*

Priority *A*

2.0.0.0.30 FR030

Statement *When a user includes a plugin to a session, the user has to decide which rights the specific users in the session has on the plugin. (see user requirement UR023)*

Priority *A*

2.0.0.0.31 FR031

Statement *While the session the user who added a plugin to the session (only this user) can change the permissions of the other users. (see user requirement UR023)*

Priority *A*

2.0.0.0.32 FR032

Statement *The system supports registered and unregistered users. (see user requirement UR023)*

Priority *A*

2.0.0.0.33 FR033

Statement *Registered shall be able to store their settings made at previous logins, sessions and able to record plugins. Unregistered user always start with default settings and changes they made are only valid for their current session. (see user requirement UR020)*

Priority *A*

2.0.0.0.34 FR034

Statement *The system provides a Weka plugin where the user must specify a dataset in arff format (which have to be located on the server where the application is running), parameters and the algorithm which shall be used. (see user requirement UR005)*

Priority *A*

2.0.0.0.35 FR035

Statement *The system provides an OpenTox plugin which implements the OpenTox Application programming interface. (see user requirement UR005)*

Priority *A*

2.0.0.0.36 FR036

Statement *When a user shares his/her screen all rights of other users are temporarily set to readonly. (see user requirement UR006)*

Priority *A*

2.0.0.0.37 FR037

Statement *The system includes a version-control-system to provide sharing and editing documents. The user can select and edit the latest version but has the opportunity to open older revision in a readonly mode. When changing a file a new revision is created and uploaded to the server. (see user requirement UR007)*

Priority *A*

2.0.0.0.38 FR038

Statement *When two users trying to work simultaneously on the same file there are two cases.*

In the case that both users are in the same session they can work simultaneously.

In the other case the user who wants to open the file secondly opens the file in an readonly mode. (see user requirement UR007)

Priority *A*

2.0.0.0.39 FR039

Statement *When a user logs in he/she has got the possibiltiy to add other registered users to its adressbook. A user can be added in 3 ways.*

1. When a user is in a conference he/she can click on an other username and select "Add to adressbook".

2. On every users profile there is an option to add these contact to the adressbook.

3. When a user invites someone and this person registers they both appear in each others adressbook.

Of course users can be removed from an adressbook. There is also the possibility to organize the contacts in groups. (see user requirement UR011)

Priority *A*

2.0.0.0.40 FR040

Statement *With the addressbook it is possible to invite multiple users in a group with one click to a conference. (see user requirement UR011)*

Priority *A*

2.0.0.0.41 FR041

Statement *The system provides a Flexdock GUI where the user can freely drag and resize windows. The flexdock is designed that every plugin can have its own dock. (see user requirement UR012, UR015)*

Priority *A*

2.0.0.0.42 FR042

Statement *Users can customize the appearance in the user settings. (see user requirement UR016)*

Priority *A*

2.0.0.0.43 FR043

Statement *The system makes use of Interactive Connectivity Establishment. ICE delivers techniques to establish connections to clients even they are behind a firewall or router. (see user requirement UR017)*

Priority *A*

2.0.0.0.44 FR044

Statement *The system supports the following browsers:*

- 1. Chrome/Chromium X*
- 2. Firefox Y.*
- 3. Opera (see user requirement UR018)*

Priority *A*

2.0.0.0.45 FR045

Statement *The system supports at least one of the available browsers for the following mobile operating systems:*

- 1. Android 2.1+*
- 2. iOS 5.0+*

No additional app (except perhaps browser) is needed. (see user requirement UR018, UR021, UR024)

Priority *A*

2.0.0.0.46 FR046

Statement *The well defined plugin api ensures that every plugin offers ways to handle different rights and views. (see user requirement UR023)*

Priority *A*

2.0.0.0.47 FR047

Statement *The system provides a settings area where users can view and change their current settings (background colour, font-size, font, font-colour and if its allowed to record the user) made to the theme and the plugins. (see user requirement UR016)*

Priority *A*

2.0.0.0.48 FR048

Statement *The only things which are needed to use the software are an internet-connection and a browser which deals with HTML5 and the webRTC. (see user requirement UR016)*

Priority *A*

2.0.0.0.49 FR049

Statement *The system makes the user who first invites another member to a plugin (so he starts a session) to the session admin. (see user requirement UR032)*

Priority *A*

2.0.0.0.50 FR050

Statement *The system allows the session admin to give permissions to the session members. These permissions are the right to add plugins or kick and add other users. (see user requirement UR032)*

Priority *A*

2.0.0.0.51 FR051

Statement *Every user registered or not is able to invite other people. The only thing he/she needs is a valid email adress to where the invitationlink is sent. (see user requirement UR031)*

Priority *A*

2.0.0.0.52 FR052

Statement *The system provides an administration area where the system admin can trigger manual backups and has database access where he/she can update the period between the garbage collection. (see user requirement UR029)*

Priority *A*

Chapter 3

Scenarios

3.1 Logging into the system

INITIAL ASSUMPTION: *The user has an internet browser running and opened the system website.*

NORMAL: *The user clicks on the login-button located at a prominent position on the website. A dialogue window opens up and the user has to fill his e-mail-address and password into the form. After submitting the systems window interface opens up in the browserwindow. Initially there are no Plugins open. If the user had active Plugins during his last logout, these Plugins will be opened again.*

WHAT CAN GO WRONG: *The connection to the database is damaged and therefor the login information can not be confirmed. So there will be an error message for the user.*
The user types in a wrong e-mail address or a wrong password. In this case a message appears, that the e-mail address or the password is wrong.
The user is not registered to the System. In this case an error message appears, that the e-mail address or the password is wrong.
The connection to the internet is lost.

OTHER ACTIVITIES:

SYSTEM STATE ON COMPLETION: *The user is logged in and able to use the system.*

3.2 Starting a Video-Chat-Session

INITIAL ASSUMPTION: *The user has an internet browser running and opened the system website, where he is logged in as registered user.*

NORMAL: *The user opens a new window in the browser and starts the video-chat-plugin. For this he pushes a button in the middle of the new window where a context menu appears and the user can choose out of many plugins which he wants to open. After the video plugin is started, the user can invite another user to his plugin and can set the permissions of the other users. So he can choose if they are allowed to add plugins or not, or if they can kick other users or invite some. This starts a session. To invite other users to this plugin there are two different ways. First he can push on an addressbook button so that he can see his addressbook and can choose a contact or group to chat with. In the second way he searches over a field shown in the video plugin for another user via his e-mail address. By choosing a user he has to give permissions to the user like described above. After he has invited a few people to his chat, he must wait for their acceptance. While waiting the user hears a telephone ring. If a member accepts the invitation the ringing stops and the users see each other in the video plugin. If more than one user accepts in the video plugin window different views appear. Each view for another user.*

WHAT CAN GO WRONG: *Maybe no one answers the invitation. In this case the ringing stops after 2 minutes and the user has the opportunity to restart the session.*

In another case the internet connection of another user will be lost. In this case he leaves automatically the chat. In the same manner the others will see a lost internet connection of your one. By restarting the system the session will be lost. So the others have to invite the lost people again. So in the case, that the session admin loses his connection the whole session will be closed.

A third possibility is a server crash. In this case the session is lost and has to be newly initialized.

OTHER ACTIVITIES:

SYSTEM STATE ON COMPLETION: *The user has a video chat with an arbitrary number of people.*

3.3 Adding plugins to a session

INITIAL ASSUMPTION: *The user has an internet browser running and opened the system website, where he is logged in as a registered user and has opened a session with other users.*

NORMAL: *The user starts in another window in his browser a new plugin. For example the digital whiteboard. Now he wants to add the whiteboard to the session. If the user is the session admin this is very simple. He clicks on the button share in the plugin field of the whiteboard and chooses out of a list of opened sessions the wished session. In an upcoming context menu he has to give permissions to the session members. There he can*

give the permission to watch or to watch and draw. After this the plugin is added to the session and the session members will see a new window open on her screen with the whiteboard on it. If the user who wants to add is no session admin there are two possibilities. In the first case he has the right to add plugins. So this is like he is session admin. If he has no rights to add plugins a error occupies, that he has not the necessary permissions.

WHAT CAN GO WRONG: *The session can crash while adding. In this case nothing happen, what means that the plugin won't add to the session.*

OTHER ACTIVITIES:

SYSTEM STATE ON COMPLETION: *The user has added a new plugin to the session.*