

EXAMPLE - SMARTYCHECK

This document contains an example of how the SMartyCheck technique works for defect detection of the diagram with embedded defects of the Mobile Media Software Product Line (SPL) component diagram.

1. Mobile Media Software Product Line

Mobile Media (MM) is an SPL composed of applications (products) that manipulate music, videos and photos for mobile devices such as smartphones and tablets. Provides support for managing (creating, deleting, viewing, executing and sending) different types of media (Young, 2005; Geraldi and OliveiraJr, 2017).

Part of the description of the Mobile Media use cases was taken from the work of Choma (2017) and are presented as follow:

UC1: Log in

Category: mandatory

Description: User enters login and password and the system validates the data.

UC2: Send Media

Category: optional

Description: User selects and sends a certain media to another device.

UC3: Manage Album

Category: mandatory

Description: User performs general control of album entries. It encompasses the operations of creating, deleting and listing albums.

UC4: Manage Media

Category: mandatory

Description: User performs general control of media records. It encompasses the operations of creating, deleting and listing records.

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UC5: Manage Favourite Media

Category: optional

Description: User performs control of favorite media. It encompasses the operations of setting favorite media and listing favorite media.

UC6: Play Media

Category: mandatory

Description: User execute a media according to the possibilities of the product.

UC7: Add Media to Album

Category: mandatory

Description: User selects a media and links it to a certain album stored in the system.

UC8: Link Media with Address Book Entry

Category: optional

Description: User links media to a particular contact so that it plays when there is a call from that contact.

UC9: View/Hear Media from Incoming Caller

Category: optional

Description: When receiving a call, the system plays the media linked to the contact.

UC10: Label Files

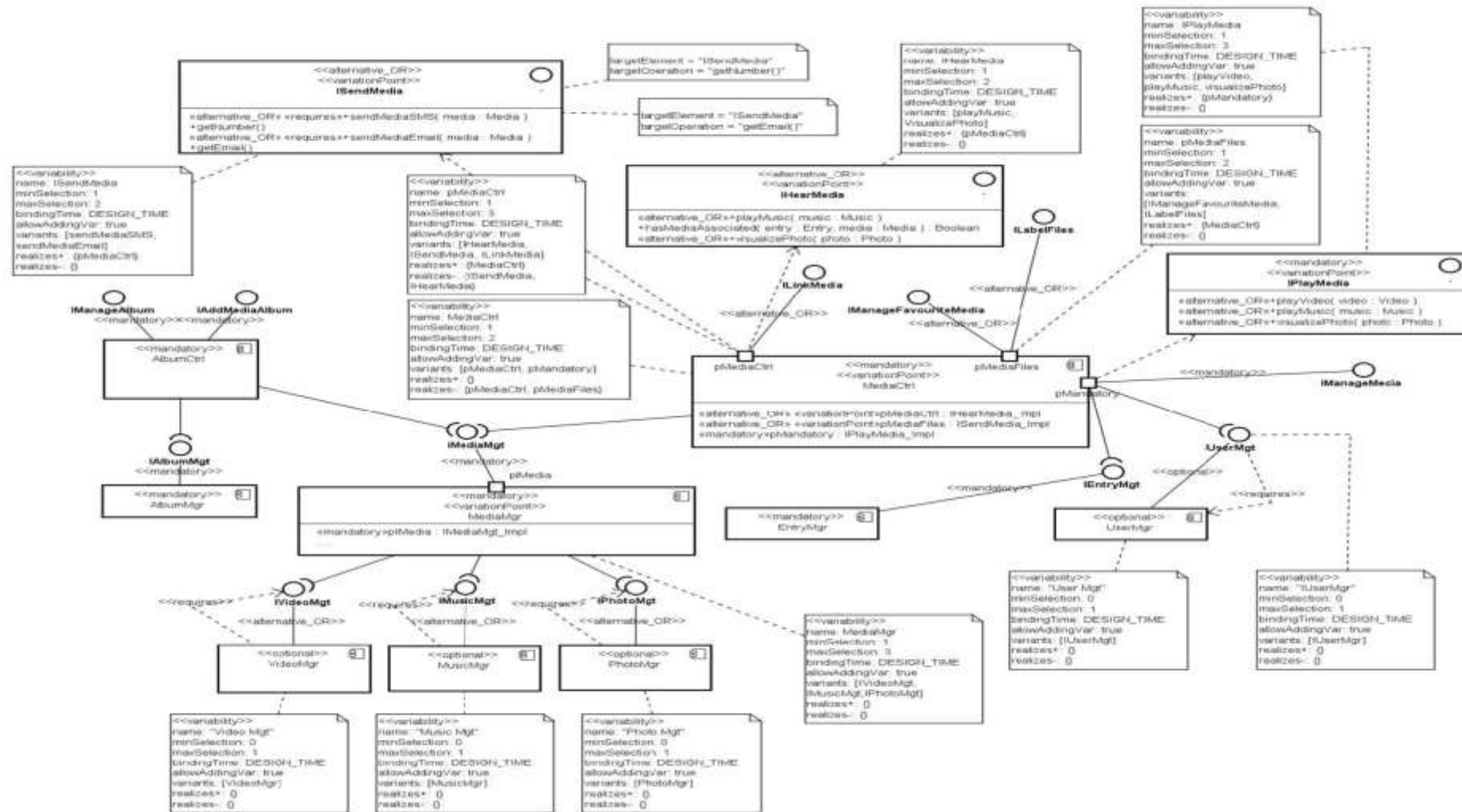
Category: optional

Description: User inserts a label for a certain media, which can be video, photo or music.

2. Component Diagram

In Figure 1, the component diagram for Mobile Media is presented with defects incorporated. Use SMartyCheck checklist for inspect this diagram for defect detection.

Figure 1: Component Diagram for SPL Mobile Media - Original Version





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DEFECT TYPE	ID	CHECKLIST ITEMS	YES	NO	DEFECT IDENTIFIED
Business Rule (BR)	BR.1	The use case/class is not clear with the purpose and the desired functionalities based on defined domain.		X	
Inconsistency (Incons)	Incons.1	Is there any use case/class specified with the stereotype <<variationPoint>> from which the number of specified variants is major or minor than defined in maxSelection or minSelection the variability (<<variability>>) associated?	X		The MediaMgr component only has 2 variants when it should have 3. The pMediaCtrl port should have 2 associated variants, but the ILinkMedia variant was not specified in the diagram.
	Incons.2	Is there any use case/class specified with the stereotype <<optional>> from which the number of specified variants is major or minor than defined in maxSelection or minSelection the variability (<<variability>>) associated?	X		The PhotoMgr component was specified with minSelection=1 when, as it is an optional component, it should have a value of 0.
Incorrect Fact (IF)	IF.1	Is there any use case/class with incorrectly name in SPL?		X	
	IF.2	Is there any use case/class that it is not be compare name in SPL?		X	
	IF.3	Is there any use case/class with stereotype <<variationPoint>> associated with use case/class in the SPL which not <<alternative_OR>>?		X	
Non-modifiable (Nm)	Nm.1	Is there any use case/class specified with the stereotype <<variationPoint>>, in which variants associated (<<optional>>, <<alternative_OR>> or <<alternative_XOR>>) can not be combined or selected in accordance with variants already specified in the meta-attribute variants in SPL?	X		The IGameMgr interface cannot be selected according to the variants defined in the variants set
Omission (Om)	Om.1	Is there any use case/class specified as mandatory (required) through the stereotype <<mandatory>> that is not specified on the SPL?		X	Required components UserMgr and IaddMediaAlbum not specified in diagram
Extraneous Information (EI)	EI.1	Is there any use case/class specified besides use cases/class existing in the SPL?	X		The IGameMgr interface and the GameMgr component were specified in addition to the LPS domain
	EI.2	Is there any use case/class with its functionality duplicated in SPL?	X		EntryMgr component is duplicated
Intentional Deviation (ID)	ID.1	Is there any use case/class which requires the selection of another (<<requires>>) and this another is not specified in the SPL?	X		The IUserMgt interface requires the presence of the UserMgr component and it was not specified in the diagram.
	ID.2	Is there any use case/class not which requires selection of another (<<mutex>>) and this another is not specified in the SPL?		X	
Ambiguous (Am)	Am.1	Is there any use case/class in that its name is equal to the another use case/class in a manner to owning a duplicate interpretation?	X		The EntryMgr component is duplicated.

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Anomaly (An)	An.1	Is there any use case/class specified as <<alternative_OR>> which extend <<extend>> another use case/class that is not specified <<variationPoint>>?		X	
	An.2	Is there any use case/class specified as <<alternative_XOR>> which extend <<extend>> another use case/class that is not specified <<variationPoint>>?		X	
Unstable (Uns)	Uns. 1	Is there any use case/class specified with the stereotype <<variationPoint>>, in which has the stereotype associated <<variability>> from which the meta-attribute name equals to other use cases/class elsewhere specified with the stereotype <<variationPoint>>?		X	
Infeasible (Inf)	Inf.1	Is there any use case/class specified with stereotype <<variationPoint>> which not allows you to add new variants as defined in the meta-attribute allowsAddingVar = false ?		X	