Kiem Verbindt Software Architectuur

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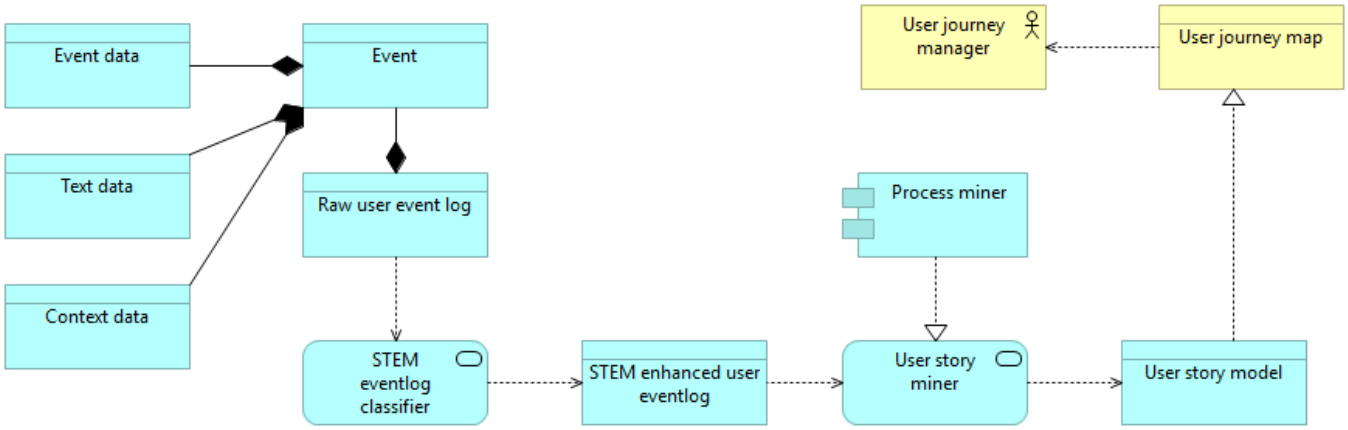
Purpose

Views

Mapping

No viewpoint



Documentation

This view describes how based upon events, a User journey map can be constructed to be interpreted by a User journey manager.

Our story starts with the eventlog. How this log came to be is not the concern of this architecture. The log contains different events and is possibly enhanced to represent STEM aspects.

S: Sentiment
T: Topic
E: Emotion
M: Motivation
On top of that extra events can be deduced from text.

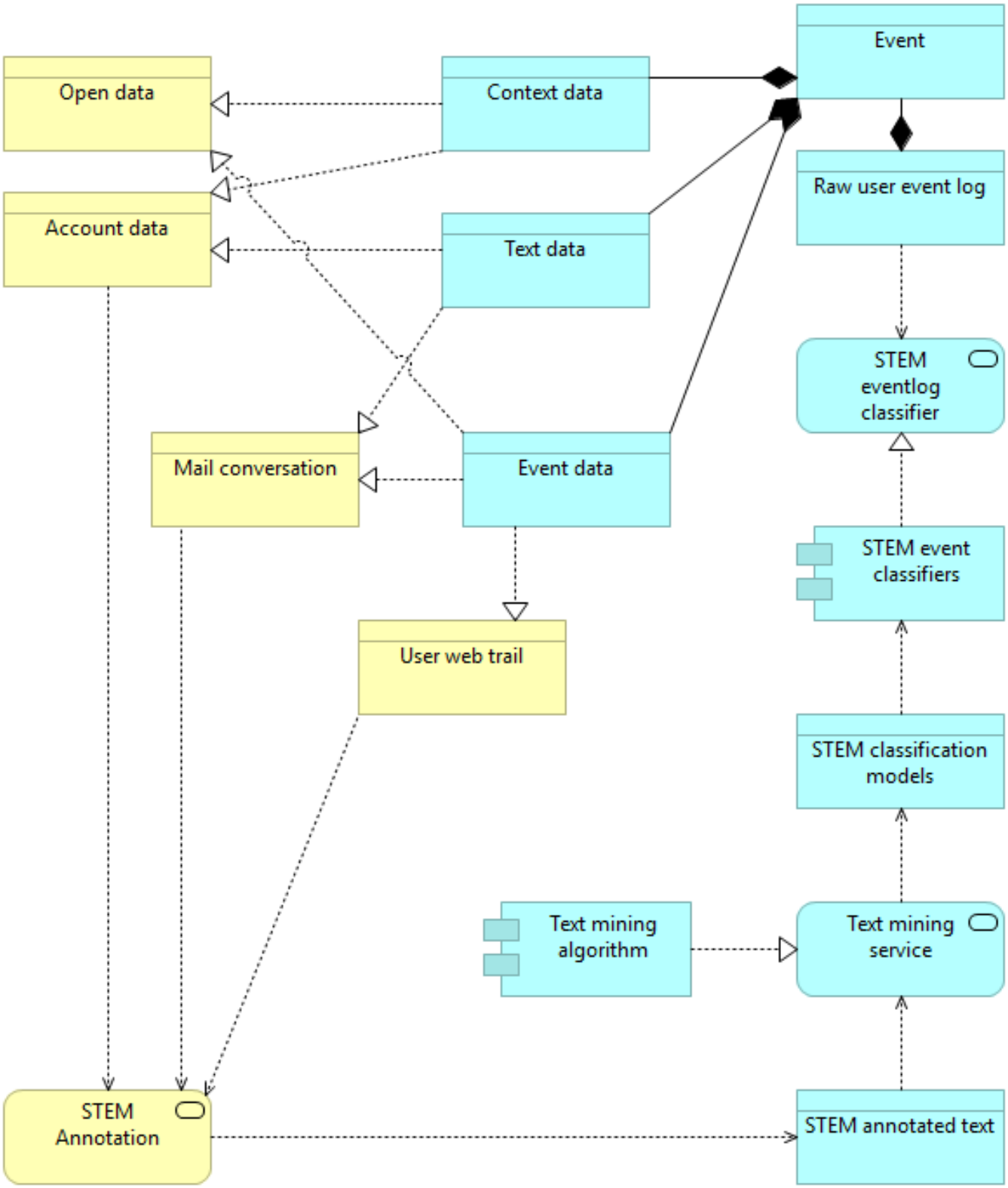
The STEM enhanced eventlog in turn is used to build a model that can be viewed.

Elements

Element	Type
Context data	Data Object
Event	Data Object
Event data	Data Object
Process miner	Application Component
Raw user event log	Data Object
STEM enhanced user eventlog	Data Object
STEM eventlog classifier	Application Service
Text data	Data Object
User journey manager	Business Actor
User journey map	Business Object
User story miner	Application Service
User story model	Data Object

Parameterization

No viewpoint



Documentation

To enable Mapping and Prediction the STEM eventlog classifier needs classification models. These models describe how to classify a text for one of the aspects.

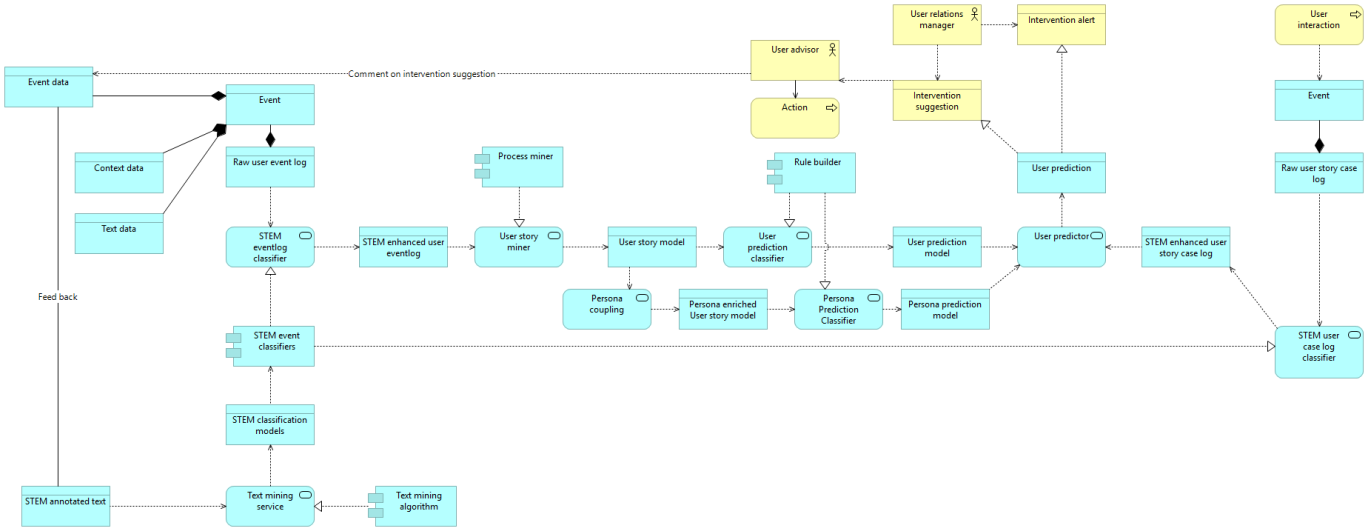
The models are built by using text mining. For this to succeed, annotated text is needed. This can be created manually by adding annotations to domain relevant text quotations.

Elements

Element	Type
Account data	Business Object
Context data	Data Object
Event	Data Object
Event data	Data Object
Mail conversation	Business Object
Open data	Business Object
Raw user event log	Data Object
STEM annotated text	Data Object
STEM Annotation	Business Service
STEM classification models	Data Object
STEM event classifiers	Application Component
STEM eventlog classifier	Application Service
Text data	Data Object
Text mining algorithm	Application Component
Text mining service	Application Service
User web trail	Business Object

Prediction

No viewpoint



Documentation

Prediction is used to inform agents in the organization real time about specific user story cases that are not going as intended or to even suggest ways to improve the remainder of the case.

For a large part prediction builds on functionality also used for Mapping the user journey. You can see this on the left. The same User story model is created but from there something else follows.

The User story model itself is used to build rules that enable to predict user behavior based on past behavior. This can be done directly based on the User story model which results in a User prediction model. It is also possible to enhance the User story model manually so that a distinction between different persona is made. This results in a Persona prediction model.

Both models can be used to predict user behavior based on already recorded behavior in the form of a user story case log. Based on these predictions intervention alerts and intervention suggestions can be created.

Elements

Element	Type
Action	Business Process
Context data	Data Object
Event	Data Object
Event data	Data Object
Intervention alert	Business Object
Intervention suggestion	Business Object
Persona coupling	Application Service
Persona enriched User story model	Data Object
Persona Prediction Classifier	Application Service
Persona prediction model	Data Object

Element	Type
Process miner	Application Component
Raw user event log	Data Object
Raw user story case log	Data Object
Rule builder	Application Component
STEM annotated text	Data Object
STEM classification models	Data Object
STEM enhanced user eventlog	Data Object
STEM enhanced user story case log	Data Object
STEM event classifiers	Application Component
STEM eventlog classifier	Application Service
STEM user case log classifier	Application Service
Text data	Data Object
Text mining algorithm	Application Component
Text mining service	Application Service
User advisor	Business Actor
User interaction	Business Process
User prediction	Data Object
User prediction classifier	Application Service
User prediction model	Data Object
User predictor	Application Service
User relations manager	Business Actor
User story miner	Application Service
User story model	Data Object

Business Layer

Account data

Type	Business Object

Information about a specific user or account that can be useful to interpret actions of the user or agents of the organization.

Action

Type	Business Process

Actions taken by the User advisor.

Intervention alert

Type	Business Object

An intervention alert, alerts a User relations manager so that he can intervene.

Intervention suggestion

Type	Business Object

Suggestion to the User advisor on how to act towards the user.

Mail conversation

Type	Business Object

Event log where successive mails are events.

Open data

Type	Business Object

Event data like tweeds on twitter or other information that might explain behavior of users like the weather on a specific day and location.

STEM Annotation

Type	Business Service

Annotating text with STEM specific annotations.

S: Sentiment
T: Topic
E: Emotion
M: Motivation

User advisor

Type	Business Actor

User interaction

Type	Business Process

> Users interacting through touch points creates events.

User journey manager

Type	Business Actor

> Manages the user journey for the users

User journey map

Type	Business Object

> Visualization of the User story model. Of course multiple visualizations of the same model are possible because of the multi dimensionality of the User story model.

User relations manager

Type	Business Actor

User web trail

Type	Business Object

> Event log that shows relevant click events from the user.

Application Layer

Context data

Type	Data Object

Attributes data that is relevant to the event or to a whole case but is not directly related to the event itself.

Event

Type	Data Object

Refers to one activity instance related to one process instance (case) and one timestamp; event refers to a case, an activity instance, and a point in time; events have attributes; events have a name (the classifier of the event), which default is the activity it refers to, but that is not mandatory;

Event data

Type	Data Object

Attributes structured data directly related to the event

Persona coupling

Type	Application Service

Using the user story model, specific paths are associated with specific persona.

Persona enriched User story model

Type	Data Object

A User Story Model where certain paths are annotated with persona information.

Persona Prediction Classifier

Type	Application Service

A classifier that builds rules that enable to detect what kind of persona is involved in a specific user story.

Persona prediction model

Type	Data Object

A set of rules that enable automatic prediction of the persona involved in a specific user story.

Process miner

Type	Application Component

Process mining solutions like ProM or BupaR or their commercial counterparts.

Raw user event log

Type	Data Object

The raw user event log contains all data relating to events in the user stories that was obtained from various sources. Creating the event log is not part of this architecture because this is specific to the organizations providing the log.

Raw user story case log

Type	Data Object

The Raw user story case log contains all data relating to events in a specific user story that was obtained from various sources. Creating the Raw user story case log is not part of this architecture because this is specific to the organizations providing the log.

Rule builder

Type	Application Component

STEM annotated text

Type	Data Object

To create text classification models annotated text is used.

STEM classification models

Type	Data Object

There are different types of classification hat are used to enhance the eventlog with additional knowledge that can be mined from text:
S: Sentiment
T: Topic
E: Emotion
M: Motivation
On top of that extra events can be deduced from text.

The STEM event classification models each support specific classifications. For readability of the model these are modeled as one.

STEM enhanced user eventlog

Type	Data Object

This eventlog contains the structured information from the Raw user event log and in addition the now structured data obtained from Text data through the use of the STEM eventlog classifier.

STEM enhanced user story case log

Type	Data Object

This case log contains the structured information from the Raw user story case log and in addition the now structured data obtained from Text data through the use of the STEM eventlog classifier.

STEM event classifiers

Type	Application Component

There are different types of classification hat are used to enhance the eventlog with additional knowledge that can be mined from text:
S: Sentiment
T: Topic
E: Emotion
M: Motivation
On top of that extra events can be deduced from text.

The STEM event classifiers each perform specific classifications. For readability of the model these different classifiers are modeled as one.

STEM eventlog classifier

Type	Application Service

There are different types of classification hat are used to enhance the eventlog with additional knowledge that can be mined from text:
S: Sentiment
T: Topic
E: Emotion
M: Motivation
On top of that extra events can be deduced from text.

The STEM eventlog classifier bundles the functionality of the different underlying classifiers.

STEM user case log classifier

Type	Application Service

There are different types of classification hat are used to enhance the eventlog with additional knowledge that can be mined from text:
S: Sentiment
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On top of that extra events can be deduced from text.

The STEM user case log classifier bundles the functionality of the different underlying classifiers.

Text data

Type	Data Object

Text data usually relates directly to a single event and in that way it can be viewed upon as unstructured event data. It can however relate to multiple events and even to events that are not in the raw user eventlog.

Text mining algorithm

Type	Application Component

Text mining as a broad concept is used for different aspects of STEM classification. Different algorithms will be used but are modeled as one to maintain readability of the model. Usually supported learning algorithms are used.

Text mining service

Type	Application Service

Text mining as a broad concept is used for different aspects of STEM classification. Different services will be used but are modeled as one to maintain readability of the model.

User prediction

Type	Data Object

Prediction of the most likely next steps. Based on this an advice or an intervention alert can be given.

User prediction classifier

Type	Application Service

A classifier that builds rules to classify the expected next step from the user.

User prediction model

Type	Data Object

A set of rules that enable automatic prediction of the next step in a specific customer story.

User predictor

Type	Application Service

A prediction algorithm that uses the User prediction model and / or the Persona prediction model to predict the most likely next steps. Based on this an advice or an intervention alert can be given.

User story miner

Type	Application Service

Mines eventlogs and creates models / a model that represent the historic user stories.

User story model

Type	Data Object

The user story model is a model that "shows" the different user stories as a process.

Relations

Access relation

Type	Access relation
Source	Text mining service
Target	STEM classification models

Access relation

Type	Access relation
Source	Text mining service
Target	STEM annotated text

Realization relation

Type	Realization relation
Source	Text mining algorithm
Target	Text mining service

Access relation

Type	Access relation
Source	STEM eventlog classifier
Target	Raw user event log

Access relation

Type	Access relation
Source	STEM eventlog classifier
Target	STEM enhanced user eventlog

Access relation

Type	Access relation
Source	STEM event classifiers
Target	STEM classification models

Realization relation

Type	Realization relation
Source	STEM event classifiers
Target	STEM eventlog classifier

Realization relation

Type	Realization relation
Source	STEM event classifiers
Target	STEM user case log classifier

Access relation

Type	Access relation

Source	STEM user case log classifier
Target	Raw user story case log

Access relation

Type	Access relation
Source	User story miner
Target	STEM enhanced user eventlog

Realization relation

Type	Realization relation
Source	Process miner
Target	User story miner

Access relation

Type	Access relation
Source	User story miner
Target	User story model

Access relation

Type	Access relation
Source	User prediction classifier
Target	User story model

Composition relation

Type	Composition relation
Source	Event
Target	Event data

Composition relation

Type	Composition relation
Source	Event
Target	Text data

Composition relation

Type	Composition relation
Source	Event
Target	Context data

Realization relation

Type	Realization relation
Source	User story model
Target	User journey map

Access relation

Type	Access relation
Source	User journey manager
Target	User journey map

Realization relation

Type	Realization relation
Source	Rule builder
Target	User prediction classifier

Access relation

Type	Access relation
Source	User prediction classifier
Target	User prediction model

Access relation

Type	Access relation
Source	STEM user case log classifier
Target	STEM enhanced user story case log

Access relation

Type	Access relation
Source	User predictor
Target	User prediction model

Access relation

Type	Access relation
Source	User predictor
Target	STEM enhanced user story case log

Access relation

Type	Access relation
Source	User predictor
Target	User prediction

Access relation

Type	Access relation
Source	User relations manager
Target	Intervention alert

Access relation

Type	Access relation
Source	User relations manager
Target	Intervention suggestion

Access relation

Type	Access relation
Source	User advisor
Target	Intervention suggestion

Realization relation

Type	Realization relation
Source	User prediction
Target	Intervention alert

Realization relation

Type	Realization relation
Source	User prediction
Target	Intervention suggestion

Realization relation

Type	Realization relation
Source	Context data
Target	Open data

Realization relation

Type	Realization relation
Source	Context data
Target	Account data

Realization relation

Type	Realization relation
Source	Text data
Target	Mail conversation

Realization relation

Type	Realization relation
Source	Event data
Target	User web trail

Realization relation

Type	Realization relation
Source	Text data
Target	Account data

Realization relation

Type	Realization relation
Source	Event data

Target	Mail conversation

Access relation

Type	Access relation
Source	STEM Annotation
Target	Account data

Access relation

Type	Access relation
Source	STEM Annotation
Target	Mail conversation

Access relation

Type	Access relation
Source	STEM Annotation
Target	User web trail

Access relation

Type	Access relation
Source	STEM Annotation
Target	STEM annotated text

Access relation

Type	Access relation
Source	User interaction
Target	Event

Realization relation

Type	Realization relation
Source	Rule builder
Target	Persona Prediction Classifier

Access relation

Type	Access relation
Source	User story miner
Target	STEM enhanced user eventlog

Access relation

Type	Access relation
Source	Persona Prediction Classifier
Target	Persona prediction model

Access relation

Type	Access relation

Source	User predictor
Target	Persona prediction model

Serving relation

Type	Serving relation
Source	User advisor
Target	Action

Access relation

Type	Access relation
Source	Persona coupling
Target	User story model

Access relation

Type	Access relation
Source	Persona coupling
Target	Persona enriched User story model

Access relation

Type	Access relation
Source	Persona Prediction Classifier
Target	Persona enriched User story model

Composition relation

Type	Composition relation
Source	Raw user event log
Target	Event

Composition relation

Type	Composition relation
Source	Raw user story case log
Target	Event

Realization relation

Type	Realization relation
Source	Event data
Target	Open data

Comment on intervention suggestion

Type	Access relation
Source	User advisor
Target	Event data

Feed back

Type	Association relation
Source	Event data
Target	STEM annotated text

> Comment on intervention suggestions is used as annotation to improve classification models. This requires a standardized set of possible replies from the User advisor.