Claims

1. A server arrangement ~~(112, 234) for managing~~ to process observation data of wireless devices~~, such as smartphones~~, comprising:

data input logic ~~(300) for obtaining~~ to obtain observation data from ~~a number of~~ the wireless devices ~~and optionally supplementary data from a number of other external data sources, the obtained data including behavioural, contextual, and optionally technical raw data relative to the wireless devices,~~ the observation data comprising application usage data;

data mining logic ~~(500) for establishing a number of derived data elements (116), such as data tables or databases, on the basis of processing and analysing the obtained~~ to process the observation ~~and optional supplementary~~ data~~, said processing and analysing incorporating data aggregation, wherein at least one derived data element includes usage metrics with contextual and optionally technical dimension relative to one or more applications or other features of one or more wireless devices and users thereof,~~ to identify temporally adjacent applications to generate usage metric data;

~~a data storage (400) for storing the obtained data (402) and the number of derived data elements (403),~~ and

data distribution logic ~~(600) for providing derived data to one or more other entities~~ to transmit advertisements to the wireless devices based on the usage metric data.

~~2. The arrangement of claim 1, wherein said data distribution logic is configured to perform at least one action selected from the group consisting of: to serve a data query constructed by an external entity through provision of derived information from one or more derived data elements according to the query parameters, and to push derived information from one or more derived data elements to an external entity according to a predetermined push logic.~~

~~3. The arrangement of any preceding claim, configured to generate derived data for adapting a network service or an application of a wireless device according to the behavioural and/or contextual characteristics of the user of the wireless device determined on the basis of derived data elements.~~

24. The server arrangement of ~~any preceding~~ claim 1, ~~configured~~ wherein the data distribution logic is to generate derived data for personalized advertising ~~from the standpoint of a~~ for users of ~~a~~ the wireless devices ~~according to the~~ based on behavioural ~~and/or contextual~~ characteristics of the user determined ~~on the basis of derived data elements~~ from the usage metric data.

~~5. The arrangement of any preceding claim, configured to map an indication of wireless device platform and/or used application, said indication being received in said obtained data, to other, more generic indication of the platform and/or application so as to enable logical grouping of data associated similar platforms and/or applications together.~~

~~36.~~ The server arrangement of ~~any preceding~~ claim 1, ~~configured~~ wherein the data mining logic is to determine an intensity variable~~, being an activity indicator in time domain relative to a selected time unit for a wireless device user or a plurality of users in view of an application or an application category including a plurality of~~ based on the temporally adjacent applications.

~~7. The arrangement of any preceding claim, configured to determine a usage frequency for an application.~~

~~8. The arrangement of any preceding claim, wherein said processing and analysing includes at least one procedure selected from the group consisting of: correlation, clustering, and factoring.~~

~~9. The arrangement of claim 8, configured to apply a clustering algorithm on the obtained data for behavioural segmentation of wireless device users to form behaviourally coherent user groups, factor analysis to categorize applications and/or content, or pattern recognition to draw relationships between entities such as actions, users and/or applications.~~

~~10. The arrangement of any preceding claim, wherein the observation data includes at least one element selected from the group consisting of: data relating to a communication action such as initiating a call, answering a call, writing, sending, receiving, or reading a message, sensor data, application usage data, microphone usage data, loudspeaker/audio output data such as music reproduction data, camera usage data, user input data, user interface usage data, calendar entry related data, audio and/or video recording, location data, time data, identification data of a close device, device status data, cellular tower signal strength data, throughput rate data, signal to noise data, data on Internet usage, and data on data usage.~~

~~11. The arrangement of any preceding claim, configured to determine descriptive behavioural statistics for a wireless device user or a group of users including location spread of communications actions, such as calls, relative to a communication action initiator, respondent, near end and/or remote location.~~

~~12. The arrangement of any preceding claim, configured to determine usage intensity or frequency variables of an application or an application category and to build a derived factor on top thereof, such as one or more generic multimedia usage indices out of music, imaging and/or video application usage variables.~~

~~4~~13. The server arrangement of ~~any preceding~~ claim 1, ~~configured~~ wherein the data mining logic is to utilize~~, on the basis of available application usage information, application and/or other activity execution~~ start and stop times ~~for the calculation of~~ for the temporally adjacent applications to calculate a usage session ~~durations in view of~~ duration for a ~~number of~~ first type of ~~applications or activities, such as music players, which are often used such that~~ application ~~runs on the background and the overall activity on a user interface level is lower~~, and to determine a usage session ~~durations~~ duration for a second type of ~~applications or activities, such as a document viewing~~ application~~, from the user interface level information~~.

~~5~~14. The server arrangement of ~~any preceding~~ claim 1, ~~configured~~ wherein the data mining logic is to determine a statistical model of usage behavior to provide ~~an~~ a status estimate for a ~~user's or a~~ user ~~group's status~~ at a particular instant ~~in view of location and/or usage of an application or other wireless device feature~~ based on the usage metric data.

6. The server arrangement as defined in claim 1, wherein the data mining logic is to build a behavior model based on the identified temporally adjacent applications, the behavior model to describe user behaviors associated with the wireless devices.

7. The server arrangement as defined in claim 6, wherein the data mining logic is to apply the behavior model to predict a usage duration of a second application in response to detecting usage of a first application.

8. The server arrangement as defined in claim 1, wherein temporally adjacent applications comprise at least two applications in sequential time order.

~~15. The arrangement of any preceding claim, configured to enrich the observation data with said supplementary data~~

~~9.~~16. A method ~~for cultivating~~ to cultivate observation data ~~provided by a number of~~ for wireless devices, comprising:

~~-~~obtaining and storing ~~(816)~~ the observation data from ~~a number of~~ the wireless devices ~~and optionally supplementary data from a number of other external data sources~~, the ~~obtained~~ observation data including ~~behavioural, contextual, and optionally technical raw data relative to the wireless devices,~~ application usage data;

~~-establishing and storing (818) a number of derived data elements on the basis of processing and analysing the obtained observation and optional supplementary data, said processing and analysing incorporating data aggregation, wherein at least one derived data element includes usage metrics with contextual and optionally technical dimension relative to one or more applications or other features of one or more wireless devices and users thereof,~~ to identify temporally adjacent applications to generate usage metric data; and

~~-providing derived data (820) from one or more derived data elements to one or more other entities~~ transmitting advertisements to the wireless devices based on the usage metric data.

~~17. Computer software comprising code means adapted, when run on a computer, to execute the method steps of claim 16.~~

~~18. A carrier medium comprising the computer software of claim 17.~~

10. The method as defined in claim 6, further comprising building a behavior model based on at least two of the identified temporally adjacent applications, the behavior model to describe user behaviors associated with the wireless devices.

11. The method as defined in claim 10, further comprising applying the behavior model to predict a usage duration of a second application based on usage of a first application.

12. The method as defined in claim 9, wherein temporally adjacent applications comprise at least two applications in sequential time order.