

FEEDBACK SYSTEM AND METHOD OF PROVIDING FEEDBACK TO A USER

TECHNICAL FIELD

5 **[0001]** The present invention relates generally to the field of gaming, and more particularly to system and method of providing feedback to a user.

BACKGROUND

10 **[0002]** A computer or video game is an electronic game that involves human interaction with a user interface or input device to generate visual feedback. For example, personal computers (PCs), video game consoles, smart phones, and tablet computers, virtual and augmented reality systems, and other devices may act as a platform for the computer or video game. Input devices such as keyboards, game controllers, or motion sensing devices may be used to provide input to the platform running the computer or video
15 game. The computer or video games may include elements such as a series of missions, plot elements, game modes, or other types of information. Video games, such as battle royale games, involve dozens to hundreds of users (e.g., players), who start with minimal equipment and then must eliminate other opponents while avoiding being trapped outside of a shrinking "safe area" or "safe zone", with the winner being the last player or team
20 alive. Often, the player's game results only affects data on a regular interface such as personal information, leaderboards, etc.

25 **[0003]** There exists a need to provide feedback to a user based on the user's game results for a variety of purposes.

SUMMARY

30 **[0004]** Various embodiments provide a system and a method of providing feedback to a user that seek to improve engagement of users. It is against this background that the present invention has been developed.

30 **[0005]** According to a first aspect of the present invention, there is provided a method of providing feedback to a user using at least one processor, the method comprising:
obtaining configuration data in relation to a plurality of items for a game, wherein

the configuration data indicates an item promotion associated to each item of the plurality of items;

obtaining behavior data in relation to game behavior of the user with respect to a game session of the game;

5 determining at least one feedback item for the user based on the behavior data in relation to the game behavior of the user in accordance with the configuration data, wherein the at least one feedback item corresponds to one or more items of the plurality of items available to the user and one or more associated item promotions, respectively; and

10 displaying a user interface to the user based on the at least one feedback item, the user interface is indicative of a performance of the user during the game session, and comprises at least one feedback element corresponding to the at least one feedback item to be selected by the user.

[0006] According to a second aspect of the present invention, there is provided a feedback system for providing feedback to a user, the system comprising:

15 a memory; and

at least one processor communicatively coupled to the memory and configured to:
obtain configuration data in relation to a plurality of items for a game, wherein the configuration data indicates an item promotion associated to each item of the plurality of items;

20 obtain behavior data in relation to game behavior of the user with respect to a game session of the game;

determine at least one feedback item for the user based on the behavior data in relation to the game behavior of the user in accordance with the configuration data, wherein the at least one feedback item corresponds to one or more items of the plurality of items
25 available to the user and one or more associated item promotions, respectively; and

display a user interface to the user based on the at least one feedback item, the user interface is indicative of a performance of the user during the game session, and comprises at least one feedback element corresponding to the at least one feedback item to be selected by the user.

30 **[0007]** According to a third aspect of the present invention, there is provided a computer program product, embodied in one or more non-transitory computer-readable

storage mediums, comprising instructions executable by at least one processor to perform a method of providing feedback to a user, the method comprising:

obtaining configuration data in relation to a plurality of items for a game, wherein the configuration data indicates an item promotion associated to each item of the plurality
5 of items;

obtaining behavior data in relation to game behavior of the user with respect to a game session of the game;

determining at least one feedback item for the user based on the behavior data in relation to the game behavior of the user in accordance with the configuration data, wherein
10 the at least one feedback item corresponds to one or more items of the plurality of items available to the user and one or more associated item promotions, respectively; and

displaying a user interface to the user based on the at least one feedback item, the user interface is indicative of a performance of the user during the game session, and comprises at least one feedback element corresponding to the at least one feedback item to
15 be selected by the user.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] Embodiments of the present invention will be better understood and readily apparent to one of ordinary skill in the art from the following written description, by way
20 of example only, and in conjunction with the drawings, in which:

FIG. 1 shows a simplified diagram of an exemplary environment according to various embodiments of the present invention;

FIG. 2 depicts a schematic flow diagram of a method of providing feedback to a user using at least one processor according to various embodiments of the present
25 invention;

FIG. 3A shows a method for generating group information for a plurality of users, according to various example embodiments of the present invention;

FIG. 3B shows a method of providing feedback to user, according to various example embodiments of the present invention;

FIG. 4 shows a table illustrating group information including user groups with which users may be associated, according to various example embodiments of the present invention;

FIG. 5 shows a table illustrating a structure of the configuration data, according to various example embodiments of the present invention;

FIG. 6 shows a user interface which may be displayed to the user based on the at least one feedback item, according to various example embodiments of the present invention;

FIG. 7 shows a table illustrating a plurality of configuration parameters of the configuration data, according to various example embodiments of the present invention;

FIG. 8 shows a table illustrating weights associated to a plurality of items, respectively, according to various example embodiments of the present invention;

FIG. 9 shows a table illustrating drop rate, discount and price for each item configured in the configuration data, according to various example embodiments of the present invention; and

FIG. 10 illustrates a block diagram of components of the server and client devices, according to various embodiments of the present invention.

DETAILED DESCRIPTION

[0009] It will be appreciated by a person skilled in the art that the terminology used herein is for the purpose of describing various embodiments only and is not intended to be limiting of the present invention. As used herein, the singular forms "a", "an" and "the" are intended to include the plural forms as well, unless the context clearly indicates otherwise. It will be further understood that the terms "comprises" and/or "comprising", or the like such as "includes" and/or "including", when used in this specification, specify the presence of stated features, integers, steps, operations, elements, and/or components, but do not preclude the presence or addition of one or more other features, integers, steps, operations, elements, components, and/or groups thereof.

[0010] Various embodiments of the present invention may be a system, a method, and/or a computer program product. The computer program product may include a

computer readable storage medium (or media) having computer readable program instructions thereon for causing a processor to carry out aspects of the present invention.

[0011] The computer readable storage medium may be a tangible device that can retain and store instructions for use by an instruction execution device. The computer readable storage medium may be, for example, but is not limited to, an electronic storage device, a magnetic storage device, an optical storage device, an electromagnetic storage device, a semiconductor storage device, or any suitable combination of the foregoing. A non-exhaustive list of more specific examples of the computer readable storage medium includes the following: a portable computer diskette, a hard disk, a random access memory (RAM), a read-only memory (ROM), an erasable programmable read-only memory (EPROM or Flash memory), a static random access memory (SRAM), a portable compact disc read-only memory (CD-ROM), a digital versatile disk (DVD), a memory stick, a floppy disk, a mechanically encoded device such as punch-cards or raised structures in a groove having instructions recorded thereon, and any suitable combination of the foregoing. A computer readable storage medium, as used herein, is not to be construed as being transitory signals per se, such as radio waves or other freely propagating electromagnetic waves, electromagnetic waves propagating through a waveguide or other transmission media (e.g., light pulses passing through a fiber-optic cable), or electrical signals transmitted through a wire.

[0012] Computer readable program instructions described herein can be downloaded to respective computing/processing devices from a computer readable storage medium or to an external computer or external storage device via a network, for example, the Internet, a local area network, a wide area network and/or a wireless network. The network may comprise copper transmission cables, optical transmission fibers, wireless transmission, routers, firewalls, switches, gateway computers and/or edge servers. A network adapter card or network interface in each computing/processing device receives computer readable program instructions from the network and forwards the computer readable program instructions for storage in a computer readable storage medium within the respective computing/processing device.

[0013] Computer readable program instructions for carrying out operations of the present invention may be assembler instructions, instruction-set-architecture (ISA)

instructions, machine instructions, machine dependent instructions, microcode, firmware instructions, state-setting data, or either source code or object code written in any combination of one or more programming languages, including an object oriented programming language such as Java, Smalltalk, C++ or the like, and conventional
5 procedural programming languages, such as the “C” programming language or similar programming languages. The computer readable program instructions may execute entirely on the user's computer, partly on the user's computer, as a stand-alone software package, partly on the user's computer and partly on a remote computer or entirely on the remote computer or server. In the latter scenario, the remote computer may be connected to the
10 user's computer through any type of network, including a local area network (LAN) or a wide area network (WAN), or the connection may be made to an external computer (for example, through the Internet using an Internet Service Provider). In some embodiments, electronic circuitry including, for example, programmable logic circuitry, field-programmable gate arrays (FPGA), or programmable logic arrays (PLA) may execute the
15 computer readable program instructions by utilizing state information of the computer readable program instructions to personalize the electronic circuitry, in order to perform aspects of the present invention.

[0014] Aspects of the present invention are described herein with reference to flowchart illustrations and/or block diagrams of methods, apparatus (systems), and
20 computer program products according to various embodiments of the invention. It will be understood that each block of the flowchart illustrations and/or block diagrams, and combinations of blocks in the flowchart illustrations and/or block diagrams, can be implemented by computer readable program instructions.

[0015] These computer readable program instructions may be provided to a processor
25 of a general-purpose computer, special purpose computer, or other programmable data processing apparatus to produce a machine, such that the instructions, which execute via the processor of the computer or other programmable data processing apparatus, create means for implementing the functions/acts specified in the flowchart and/or block diagram block or blocks. These computer readable program instructions may also be stored in a
30 computer readable storage medium that can direct a computer, a programmable data processing apparatus, and/or other devices to function in a particular manner, such that the

computer readable storage medium having instructions stored therein comprises an article of manufacture including instructions which implement aspects of the function/act specified in the flowchart and/or block diagram block or blocks.

[0016] The computer readable program instructions may also be loaded onto a computer, other programmable data processing apparatus, or other device to cause a series of operational steps to be performed on the computer, other programmable apparatus or other device to produce a computer implemented process, such that the instructions which execute on the computer, other programmable apparatus, or other device implement the functions/acts specified in the flowchart and/or block diagram block or blocks.

[0017] Various embodiments of the present invention will now be described in detail with reference to the Figures.

[0018] FIG. 1 shows a simplified diagram of an exemplary environment 100 according to various embodiments of the present invention. The environment 100, for example, facilitates a method of providing feedback to a user (e.g., player of a game) with respect to a game.

[0019] As illustrated in FIG. 1, the environment 100 includes a server 110 and client devices 130a-130c, interconnected over a communication network 140, such as internet, intranet, local area network (LAN), wide area network (WAN) or a combination thereof. The communication network 140 may include wired, wireless, or fiber optic connections. The environment 100 may include additional computing devices, servers, computers, or other devices not shown. The environment 100 may also form part of a larger network, such as a distributed network, or a cloud computing network.

[0020] The server 110 may be a management server, a web server, or any other electronic device or computing system capable of receiving and sending data. In some embodiments, the server 110 may be a laptop computer, tablet computer, netbook computer, personal computer (PC), a desktop computer, a personal digital assistant (PDA), a smart phone, or any programmable electronic device capable of communicating with client devices 130a-130c via the communication network 140. In other embodiments, the server 110 may represent a server computing system utilizing multiple computers as a server system, such as in a cloud computing environment. The server 110 may include a game application 112, a game feedback program 114, a grouping application programming

interface (API) 115 and a game database 116. The server 110 may include components, as depicted and described in further detail with respect to FIG. 10.

[0021] The game application 112 may be a generic game program or software application. The game application 112 may be any program or application and may include various elements of the game that can be presented to a user, such as missions, game mode selections, map selections, in a non-limiting example. The game application 112 may be a computer or video game. For example, the game application 112 may be a massively multi-player online game (MMOG) or other types of game that includes a large free roaming world and a plurality of missions within that world. According to various embodiments, the game application 112 resides on the server 110. In other embodiments, the game application may reside on another server, another computing device, or on any of the client devices 130a-130c, provided that the game application 112 has access to the game feedback program 114, the grouping application programming interface 115 and/or the game database 116, and/or provided that the game application 112 is accessible to the game feedback program 114, the grouping application programming interface 115 and/or the game database 116. In some embodiments, the game feedback program 114 may be a function of the game application 112.

[0022] According to various embodiments, the game feedback program 114 may be configured to obtain configuration data in relation to a plurality of items (or products) for a game (e.g., of the game application 112). The items, for example, may be in-game items such as in-game products. The configuration data may indicate an item promotion associated to each item of the plurality of items. The item promotion, may include discount for the item.

[0023] According to various embodiments, the configuration data may include a plurality of configuration parameters. For example, the plurality of configuration parameters may comprise a match mode, a game mode, a group mode of the user, a type of game map, a ranking of the player with respect to the game session, duration of the game session, existing items owned by the user, pass status and payment level of the user.

[0024] According to various embodiments, the configuration data may further indicate a plurality of predetermined conditions associated to the plurality of configuration parameters, respectively, for the plurality of items to be available to users of the game. The

plurality of predetermined conditions may be item purchase conditions configured by operation member(s).

[0025] According to various embodiments, the configuration data may further comprise, for each item of the plurality of items, a drop rate and a weight associated to the item.

[0026] According to various embodiments, the game feedback program 114 may be configured to obtain behavior data in relation to game behavior of a user with respect to a game session (or game match or a round of game) of the game, such as a user (e.g., player of the game) playing a game session of the game application 112 on any one of client devices 130a-130c. The behavior data may be obtained after the user exits (e.g., completes or ends) the game session.

[0027] The behavior data in relation to game behavior of the user, for example, may include gamification data associated with the user. Gamification data includes information associated with the user with respect to the game, such as a digital/virtual badge, achievement, or other information relevant to the user's experience and/or ability level with regards to the game application 112. The behavior data in relation to game behavior of the user may include a plurality of game behavior indicators corresponding to the plurality of configuration parameters, respectively, with respect to the game session of the game, as will be described later.

[0028] According to various embodiments, the game feedback program 114 may be configured to determine at least one feedback item for the user based on the behavior data in relation to the game behavior of the user in accordance with the configuration data, wherein the at least one feedback item corresponds to one or more items (e.g., in-game items), of the plurality of items available to the user and one or more associated item promotions, respectively.

[0029] According to various embodiments, the above-mentioned determining at least one feedback item for the user based on the behavior data in relation to the game behavior of the user in accordance with the configuration data is based on the plurality of the game behavior indicators satisfying the plurality of predetermined conditions, respectively.

[0030] According to various embodiments, the game feedback program 114 may be configured to determine the at least one feedback item for the user further based on a user

group with which the user is associated. For example, depending on the user group which the user is associated with, the user may be associated or assigned with a group identifier.

[0031] The at least one feedback item determined for the user, for example, may be linked to login credentials of the user, such as login credentials associated with game application 112 and/or login credentials associated with a social network account. The at least one feedback item determined for the user may be stored in a data repository, such as the game database 116, for example, for further access by the game feedback program 114 and the game application 112.

[0032] According to various embodiments, the grouping application programming interface 115 resides on the server 110. In other embodiments, the grouping application programming interface 115 may reside on another server, another computing device, or on any of the client devices 130a-130c, provided that the grouping application programming interface 115 has access to the game application 112, the game feedback program 114 and/or the game database 116, and/or provided that the grouping application programming interface 115 is accessible to the game application 112, the game feedback program 114 and/or the game database 116.

[0033] According to various embodiments, the grouping application programming interface 115 may be configured to generate group information for a plurality of users (of the game) using machine learning. The group information may comprise the user group with which the user is associated. Alternatively, or additionally, the grouping application programming interface 115 may be configured to generate group information for a plurality of users using rules.

[0034] According to various embodiments, the at least one feedback item may be a plurality of feedback items for the user corresponding to a subset of items of the plurality of items (e.g., subset of the in-game items) available to the user in a bundle pool and associated item promotions, respectively. In such case, the game feedback program 114 may select the at least one feedback item from the plurality of feedback items based on the weight associated to each item of the subset of items. The above-mentioned displaying a user interface to the user may be further based on the at least one feedback item selected.

[0035] According to various embodiments, the game feedback program 114 may be configured to display a user interface to the user based on the at least one feedback item.

The user interface may be indicative of a performance of the user during the game session, and includes at least one feedback element corresponding to at least one feedback item to be selected by the user. The game feedback program 114 may be configured to display the user interface that allows an input for selection of the at least one feedback item (via the at least one feedback element) by the user at the client device, such as any one of client devices 130a-130c. For example, the user interface may be displayed to the user after the user completes the game session of the game.

[0036] The feedback element, for example, may be a graphical representation corresponding to the feedback item to be selected by the user. For example, the game feedback program 114 may present the user with a dialog box containing one graphical representation corresponding to one feedback item for selection by the user. The feedback item may be one item available to the user and associated item promotion as determined based on the behavior data in relation to the game behavior of the user in accordance with the configuration data. In other embodiments, the feedback item may be a plurality of items available to the user and a plurality of associated item promotions, respectively, as determined based on the behavior data in relation to the game behavior of the user in accordance with the configuration data. The above-mentioned display a user interface to the user may be performed after completing the game session of the game

[0037] According to various embodiments, the above-mentioned obtain behavior data in relation to game behavior of a user with respect to a game session of a game is performed after the user exits the game session.

[0038] According to various embodiments, the game feedback program 114 may release the at least one feedback element corresponding to at least one feedback item to be selected by the user for a predetermined duration of time. For example, the interface may include a prompt or notification indicating to the user that the feedback element is available for selection for a predetermined duration of time.

[0039] Accordingly, the at least one feedback item to be selected by the user may be personalized or customized to the user based on the performance of the user during a single game session (e.g., one or more in-game items and one or more associated item promotions, respectively, may be recommended to the user based on the performance of the user during the single game session instead of pricing of in-game items (or products) remaining the

same). The at least one feedback item to be selected by the user may vary based on the performance of the user during a single game session of the game application 112. For example, the game application 112 may utilize the game feedback program 114 to provide users (e.g., players) with more recognition of game results, encourage better performance in a single game, and better competition. For example, better results in a game session may lead to better product promotions and better discounts for the users. Various embodiments provide feedback based on users' game behavior to customize product promotion and exclusive discounts, thereby stimulating users to pay.

[0040] The game feedback program 114 may reside on the server 110. In other embodiments, the game feedback program 114 may reside on another server, another computing device, or any of client devices 130a-130c, provided that the game feedback program 114 has access to the game application 112, the grouping application programming interface 115 and/or the game database 116, and/or provided that the game feedback program 114 is accessible to the game application 112, the grouping application programming interface 115 and/or the game database 116 (e.g., via the communication network 140). In some embodiments, the game feedback program 114 may be a function of the game application 112.

[0041] Game database 116 may be a repository that may be written and read by the game application 112, the game feedback program 114 and/or the grouping application programming interface 115. Configuration data as described above may be stored in the game database 116. Behavior data of users (including the user of the game), such as information including a plurality of game behavior indicators corresponding to a plurality of configuration parameters, respectively, may be stored in the game database 116. For example, the plurality of game behavior indicators may correspond to a plurality of configuration parameters, such as, match mode, game mode, group mode of the user, a type of game map, ranking of the user with respect to the game session, duration of the game session, existing items owned by (e.g., including existing items given to) the user, pass status, payment level of the user, or other behavior data, for users of the game application 112 may be stored in the game database 116. Information in relation to user groups with which users (of the game or game application 112) are associated may be stored in the game database 116. The game database 116 may reside on the server 110. In other

embodiments, the game database 116 may reside on another server or another computing device, provided that the game database 116 is accessible to the game application 112, the game feedback program 114 and/or the grouping application programming interface 115.

[0042] Client devices 130a-130c may each be a desktop computer, laptop computer, netbook computer, tablet computer, personal digital assistant (PDA), or smart phone. The client devices 130a-130c may each be any electronic device or computing system capable of sending and receiving data, and communicating with the server 110 over the communication network 140. It is understood that although client devices 130a-130c are illustrated, there may be any number of client devices. The client devices may each include components, as depicted and described in further detail with respect to FIG. 10.

[0043] FIG. 2 depicts a schematic flow diagram of a method 200 (computer-implemented method) of providing feedback to a user using at least one processor according to various embodiments of the present invention. For example, the method 200 may relate to the game feedback program 114 as described with respect to FIG. 1. The method 200 comprises obtaining (at 202) configuration data in relation to a plurality of items for a game, wherein the configuration data indicates an item promotion associated to each item of the plurality of items; obtaining (at 204) behavior data in relation to game behavior of the user with respect to a game session of the game; determining (at 206) at least one feedback item for the user based on the behavior data in relation to the game behavior of the user in accordance with the configuration data, wherein the at least one feedback item corresponds to one or more items of the plurality of items available to the user and one or more associated item promotions, respectively; and displaying (at 208) a user interface to the user based on the at least one feedback item, the user interface is indicative of a performance of the user during the game session, and comprises at least one feedback element corresponding to the at least one feedback item to be selected by the user. For example, a feedback item may be a product recommendation for the user. Accordingly, product recommendation for users may be determined in accordance with the configuration data (e.g., product recommendation is decided by configurations).

[0044] According to various embodiments, the behavior data of the user comprises a plurality of game behavior indicators corresponding to a plurality of configuration parameters, respectively, with respect to the game session of the game.

[0045] According to various embodiments, the plurality of configuration parameters comprises a match mode, a game mode, a group mode of the user, a type of game map, a ranking of the player with respect to the game session, duration of the game session, existing items owned by the user (e.g., including existing items given to), pass status and payment level of the user.

[0046] The match mode parameter, for example, may include indicator 1 corresponding to casual, indicator 2 corresponding to rank. For example, casual mode is for users (e.g., players) to play for leisure only usually. For example, rank mode is for users to play for competition, to earn a ranking. In casual mode, there is no rankings. But in the rank mode, users can upgrade their ranking from bronze to gold, to platinum, etc., by winning the game. The group mode of the user parameter, for example, may include indicator 0 corresponding to a user who is playing solo (e.g., solo player), indicator 1 corresponding to a user who is playing in a group of two players, indicator 3 corresponding to a user who is playing in a group of more than two players (i.e., squad player). The game mode parameter, for example, may include indicator 1 corresponding to a first type of game play (e.g., classic mode in a battle royale game), indicator 2 corresponding to a second type of game play (e.g., cosmic racer mode in a battle royale game). The type of game map parameter, for example, may include indicator 1 corresponding to a first type of map (e.g., Bermuda in Free Fire), indicator 3 corresponding to a second type of map (e.g., Purgatory in Free Fire), indicator 4 corresponding to a third type of map (e.g., Kalahari in Free Fire). For example, the configuration data may indicate different maps in relation to the game (e.g., Bermuda, Purgatory, Kalahari, etc., for the Free Fire game). For the same game mode, users may enter different maps. The pass status parameter, for example, may include indicator 1 corresponding to the user having unlocked a predefined pass (e.g., the user unlocked the Elite Pass), indicator 2 corresponding to the predefined pass not being unlocked by the user (e.g., the user did not unlock the Elite Pass). For example, after purchasing the predefined pass (e.g., having unlocked the predefined pass), users can get more items with their season experience increasing. The payment (or purchase) level of the user parameter, for example, may include indicator 1 corresponding to never paid, indicator 2 corresponding to small payment level (e.g., a user who spends small amount of money in the game, or provides small revenue, 'small R'), indicator 3 corresponding to middle

payment level (e.g., a user who spends medium amount of money in the game, or provides medium revenue, 'middle R'), indicator 4 corresponding to big payment level (e.g., a user who spends large amount of money in the game, or provides large revenue, 'large R'), indicator 5 corresponding to haven't paid in 30 days.

5 **[0047]** According to various embodiments, the behavior data of the user comprises a plurality of game behavior indicators corresponding to a plurality of configuration parameters, respectively, with respect to the game session of the game. In a non-limiting example, the obtained behavior data in relation to game behavior of user B with respect to a game session of the game may include a plurality of game behavior indicators such as
10 indicator 1 corresponding to the match mode parameter, indicator 1 corresponding to the game mode parameter, indicator 2 corresponding to the group mode of the user parameter, indicator 2 corresponding to the type of game map parameter, indicator 2 corresponding to the ranking of the user with respect to the game session parameter, indicator 2 corresponding to the duration of the game session parameter, indicator 2 corresponding to
15 the existing items owned by the user parameter, indicator 1 corresponding to the pass status parameter and indicator 1 corresponding to the payment level of the user parameter.

[0048] According to various embodiments, the configuration data further indicates a plurality of predetermined conditions associated to the plurality of configuration parameters, respectively, for the plurality of items to be available to users of the game. The
20 above-mentioned determining at least one feedback item for the user based on the behavior data in relation to the game behavior of the user in accordance with the configuration data is based on the plurality of the game behavior indicators satisfying the plurality of predetermined conditions, respectively. For example, if user(s) meet the conditions that game mode is 1, purchase level is small R, etc., such as configured for a bundle pool, the
25 user(s) may receive the promotion of one item (e.g., corresponding to the at least one feedback item as described hereinbefore according to various embodiments) randomly based on the drop rate and weight of each item in the bundle pool. In other words, if the plurality of game behavior indicators corresponding to the plurality of configuration parameters, respectively, satisfy the predetermined conditions associated to the plurality of
30 configuration parameters, respectively, for the plurality of items to be available to users of the game, then an item will be promoted to the user depending on the drop rate and weight

of each item in a corresponding bundle pool. The drop rate of an item may be a probability of drop of the item and associated item promotion to a user. For example, if the user satisfies a specific condition, for example, "MatchMode = 1, GameMode =1, GroupMode =1, ...", he or she will receive an item promotion with 20% discount (e.g., corresponding to the at least one feedback item as described hereinbefore according to various embodiments). Accordingly, the results of the user's game session (e.g., single game results) may be recognized and provide more economic benefits to the user.

[0049] According to various embodiments, the above-mentioned determining the at least one feedback item for the user is further based on a user group with which the user is associated. According to various embodiments, the configuration data may indicate one or more user groups with which a bundle pool is associated. For example, the bundle pool associated to a user group F and one or more other user groups may be the same or different, based on configuration. In other words, different groups can share the same bundle pool or can be associated with different bundle pools. According to various embodiments, the at least one feedback item (e.g., an item and associated item promotion) may be further determined based on a drop rate and the weight of each item in a bundle pool associated to the user group. According to various embodiments, there are different items in one bundle pool, and each item has its weight in this bundle pool. Users will get the promotion of one item randomly based on the weight from a corresponding bundle pool. Each member (e.g., a member of user group F and a member of user group Z) will not get the same item (e.g., item X) in a bundle pool c1. For example, whether player 1 in group F will get item X in bundle pool c1 is probabilistic based on the drop rate and weight of item X in bundle pool c1. Users may or may not get one feedback item when they meet the conditions set in the configuration based on the drop rate. For example, if the drop rate is set to 10%, when users meet other conditions, there is 10% chance that they will receive one feedback item.

[0050] According to various embodiments, the method 200 further comprises generating group information for a plurality of users using machine learning (e.g., machine learning algorithms), the group information comprising the user group with which the user is associated. Additionally, or alternatively, the method 200 further comprises generating group information for a plurality of users using rules, the group information comprising the user group with which the user is associated.

[0051] FIG. 3A shows a method 300 for generating group information for a plurality of users, according to various example embodiments. For example, the method 300 may generate group information for a plurality of users using both machine learning and predefined rules. At 302, users' (e.g., players) data may be obtained. The users' data may cover a large amount of data in relation to the users, including all kinds of behaviors of the users. For example, the users' data may include users' level, users' rank, number of times of clicking an icon in relation to character in the game interface, number of times of clicking an icon in relation to friends in the game interface, number of times of clicking an icon in relation to lottery in the game interface, amount of coins spent in the last day, amount of diamonds spent in the last day, win rate of a type of game play (e.g., classic mode) in the past i number of days (e.g., i may be 28), average ranking of a type of game play (e.g., classic mode) in the past i number of days (e.g., i may be 28), etc.

[0052] At 304, data pre-processing of the users' data may be performed. According to various example embodiments, data pre-processing may include performing feature choosing, one-hot encoding, missing value padding, and data distribution balancing. One hot encoding is a way of pre-processing categorical features for machine learning models. One-hot encoding is the process by which categorical data are converted into numerical data for use in machine learning. At 306, training of the machine learning model may be performed. In a non-limiting example, the model (or algorithm) used may be XGBoost. For example, the model may be trained with more than 100 features, including users ip, device model, friends number, total top-up amount, etc. At 308, grouping of the users using the machine learning model may be performed to generate group information of the users. The algorithms may assign various user groups or group identifiers to users with different features in real-time. For example, the machine learning model may be used to predict the paying probability of a user. The machine learning model classifies the user to a group, for example, based on the paying probability of the user. Based on the grouping, users (e.g. players) of each group will receive different promotions and discounts. According to various example embodiments, at 310, grouping of the users using predefined or preset rules may be performed to generate group information of the users. For example, rules for user groups (e.g., user groups A to E and Z in FIG. 4) may be pre-defined. For example, the rule for user group A may be defined with the condition "Paid more than a certain

amount of USD in the past 30 days, and not in group E”, and users who satisfy this condition will be assigned to or tagged as user group A. The group information may be included or compiled in the grouping application programming interface (e.g., Melon pi API). Accordingly, the grouping application programming interface may be used to
5 provide the server information in relation to the user group of each user.

[0053] Referring to FIG. 3B, the grouping application programming interface 115 may provide to the server the user group with which each user is associated. According to various example embodiments, an operation member may configure different bundle pools for different user groups. A bundle pool may refer to a subset of items (or group or pool of
10 items). Each item of the subset of items may have an associated item promotion. In other words, each bundle pool may include a subset of items. For example, each bundle pool may be a bundle pool promotion of a subset of items, each item of the subset having an associated item promotion. Each bundle pool may have respective predetermined conditions associated to the configuration parameters, respectively, for the subset of items
15 to be available to users of the game. The information in relation to bundle pools configured for the user groups may be included in the configuration data. The server will read the configuration and judge (or determine) if the user (e.g., player) meets certain conditions, and based on the drop rate and weight of each item in the bundle pool, to promote or not to promote a certain item (e.g., corresponding to the at least one feedback item as described
20 hereinbefore according to various embodiments) to the user.

[0054] FIG. 4 shows a table 400 illustrating group information including user groups (e.g., group identifiers A, B, C, D, E, F, G, H, and Z) with which users may be associated, according to various example embodiments. Each user group may have a corresponding group definition as illustrated. As illustrated, a portion of the user groups (e.g., group
25 identifiers F, G, H) require the users to be grouped or classified using machine learning, while a remaining portion of the user groups (e.g., group identifiers A, B, C, D, E, and Z) require the users to be grouped using predefined rules.

[0055] According to various embodiments, the configuration data may further include, for each item of the plurality of items, a drop rate and a weight associated to the item. For
30 example, the weights may be set based on the experience of operation members to

maximize revenue. They may consider the popularity of the items (e.g., products) and the scarcity of the items, as well as their experience of several times of trying.

[0056] According to various embodiments, the above-mentioned determining at least one feedback item for the user based on the behavior data in relation to the game behavior of the user in accordance with the configuration data comprises determining a plurality of feedback items for the user, wherein the plurality of feedback items for the user correspond to a subset of items of the plurality of items available to the user in a bundle pool and associated item promotions, respectively. The method 200 further includes selecting the at least one feedback item from the plurality of feedback items based on the drop rate and the weight associated to each item of the subset of items; and the above-mentioned displaying a user interface to the user is further based on the at least one feedback item selected. For example, each item of the plurality of items may be assigned different weights and different drop rates (e.g., different drop probability for different products). For example, operation team may configure the weights, discounts, drop rates and items based on their analysis. The configuration may be performed in a tool, in the format of a sheet, for example. Accordingly, multiple items and discounts can be configured for the same behavior according to the needs of operation members, and randomly dropped according to the weight and drop rate. In this regard, the drop of an item is probabilistic.

[0057] By judging whether the item purchase conditions are met, the specific items and discounts that can be purchased can be determined, and multiple items and discounts can be configured for the same behavior according to the needs of operation members, and randomly dropped according to the weight and the drop rate.

[0058] According to various embodiments, the above-mentioned obtaining behavior data in relation to game behavior of a user with respect to a game session of a game is performed after the user exits the game session.

[0059] According to various embodiments, the above-mentioned displaying a user interface to the user is performed after completing the game session of the game. Accordingly, every time a user completes a single game, after returning to the lobby from the settlement interface for example, the user may be pushed to a customized product and exclusive discount according to his or her in-game behavior (game mode, game ranking, game duration, owned items, past payment behavior, etc.).

[0060] According to various embodiments, the method 200 further includes releasing the at least one feedback element corresponding to at least one feedback item to be selected by the user for a predetermined duration of time. For example, the purchase time after each drop is limited (e.g., one hour), and there is a cool down time (CD) (e.g., three days) after each drop, creating a kind of experience for players to exchange their own efforts for preferential discounts, and once they miss the experience, they will have to wait for the next opportunity, thereby stimulating players to pay.

[0061] Accordingly, various example embodiments for determining the at least one feedback item for the user (corresponding to one or more items of the plurality of items available to the user and one or more associated item promotions, respectively) may be performed according to operation configuration. FIG. 5 shows a table 500 illustrating a structure of the configuration data, according to various example embodiments. For example, the configuration data may be a configuration sheet in the formant of a csv. For example, the data structure 500 of the configuration data includes information or entries relating to the plurality of items, such as store identifier (ID), bundle identifier (ID) of each bundle pool, bundle name, price item identifier (ID), price, discount price rebate identifier (ID), discount price item identifier (ID), discount price, diamond price, diamond price, discount diamond price, discount rate, diamond bonus, whether remain diamond, slogan, etc.

[0062] FIG. 6 shows a user interface 600 which may be displayed to the user based on the at least one feedback item, according to various example embodiments. The user interface 600 includes at least one feedback element 610 corresponding to the at least one feedback item to be selected by the user (for the user's selection).

[0063] FIG. 7 shows a table 700 illustrating a plurality of configuration parameters of the configuration data, according to various example embodiments. According to various example embodiments, the table 700 illustrates configuration parameters of the configuration data in relation to a bundle pool. For example, the configuration parameters may include, bundle pool identifier (ID), start time of the effective time of the bundle pool configuration, end time of the effective time of the bundle pool configuration, exist time of an item promotion, cool down time, match mode, map identifier (ID), group mode, rank mode, minimum player's level for a bundle to show, maximum player's level for the bundle

to show, minimum player's ranking level for the bundle to show, payment level, pass status, drop situation, grouping application programming interface (API) class, drop rate, etc. The drop rate may be a probability of drop of the item and associated item promotion. For example, the probability may be 100% or anything between 0%-100% based on the configuration. For example, the configuration data may be configured with conditions for items to disappear for certain players. The table 700, for example, may be named IAPBundlePoolCondition_XX.csv.

[0064] According to various example embodiments, the configuration data may be configured with weights for each item, for example, in each bundle pool. FIG. 8 shows a table 800 illustrating weights associated to a plurality of items, respectively. In a non-limiting example, the plurality of items may be bundled in bundle pools (e.g., bundle pool 1, bundle pool 2). Different items in a same bundle pool may be configured with different weight values or a same weight value. For example, one item can be configured in different bundle pools. Users may get the promotion of one item randomly based on the weight from a corresponding bundle pool. For example, if one item has been shown to the user from bundle pool 1, the weight of the item in bundle pool 1 will become 0. For example, if one item has been bought by a user, the weight of the item in each bundle pool will become 0. The table 800, for example, may be named IAPBundlePoolRate_XX.csv.

[0065] FIG. 9 shows a table 900 illustrating drop rate, discount and price for each item configured in the configuration data, according to various example embodiments. In a non-limiting example, an item (e.g., Item 1) may be configured in different bundle pools (e.g., bundle pool 1, bundle pool 2, bundle pool 3). In a non-limiting example, an item (e.g., Item 1) may be configured with different associated item promotion in the different bundle pools. In other words, each item may be associated with different item promotions in different bundle pools (e.g., Item 1 may be associated with discount value of 9 in bundle pool 1, associated with discount value of 8 in bundle pool 2, and associated with discount value of 2 in bundle pool 3). In a non-limiting example, an item may be configured with a same drop rate in different bundle pools (e.g., drop rate of 0 configured for Item 1 in bundle pool 1, bundle pool 2 and bundle pool 3, drop rate of 1 configured for Item 2 in bundle pool 4 and bundle pool 6). The table 900, for example, may be named

IAPBundleStore.csv_XX. For example, there may be same titles in different csv, that is to map the data.

5 **[0066]** FIG. 10 illustrates a block diagram of components of the server 110 and client devices 130a-130c, according to various embodiments of the present invention. It should be appreciated that FIG. 10 provides only an illustration of one implementation and does not imply any limitations with regard to the environments in which different embodiments may be implemented. Many modifications to the depicted environment may be made.

10 **[0067]** The server 110 and client devices 130a-130c may each include communications fabric 1002, which provides communications between computer processor(s) 1004, memory 1006, persistent storage 1008, communications unit 1010, and input/output (I/O) interface(s) 1012. The communications fabric 1002 may be implemented with any architecture designed for passing data and/or control information between processors (such as microprocessors, communications and network processors, etc.), system memory, peripheral devices, and any other hardware components within a system. For example, the
15 communications fabric 1002 may be implemented with one or more data buses and in a manner known to the person skilled in the relevant art. The memory 1006 and persistent storage 308 may be computer readable storage media. For example, the memory 1006 may include random access memory (RAM) 1014 and cache memory 1016. The memory 1006 may include any suitable volatile or non-volatile computer readable storage media.

20 **[0068]** According to various embodiments, the game application 112, the game feedback program 114, the grouping application programming interface 115, and the game database 116 are stored in the persistent storage 1008 of the server 110 for execution and/or access by one or more of the respective computer processors 1004 of the server 110 via one or more memories of memory 1006 of the server 110. According to various
25 embodiments, the persistent storage 1008 may include a magnetic hard disk drive. Alternatively, or in addition to a magnetic hard disk drive, persistent storage 1008 may include a solid-state hard drive, a semiconductor storage device, read-only memory (ROM), erasable programmable read-only memory (EPROM), flash memory, or any other computer readable storage media that is capable of storing program instructions.

30 **[0069]** The media used by persistent storage 1008 may also be removable. For example, a removable hard drive may be used for persistent storage 1008. Other examples

include optical and magnetic disks, thumb drives, and smart cards that are inserted into a drive for transfer onto another computer readable storage medium that is also part of persistent storage 1008.

[0070] The communications unit 1010 may provide for communications with other data processing systems or devices. According to various embodiments, the communications unit 1010 includes one or more network interface cards. The communications unit 1010 may provide communications through the use of either or both physical and wireless communications links. The game application 112, the game feedback program 114 and the grouping application programming interface 115 may be downloaded to persistent storage 1008 of the server 110 through communications unit 1010.

[0071] The I/O interface(s) 1012 allows for input and output of data with other devices that may be connected to the server 110, and client computing devices 130a-130c. For example, I/O interface 1012 may provide a connection to external devices 1018 such as a keyboard, keypad, a touch screen, and/or other suitable input device. External devices 1018 may also include portable computer readable storage media such as, for example, thumb drives, portable optical or magnetic disks, and memory cards. Software and data used to practice embodiments of the present invention, e.g., game application 112, game feedback program 114, grouping application programming interface 115 and game database 116, can be stored on such portable computer readable storage media and can be loaded onto persistent storage 1008 of server 110 via I/O interface(s) 1012 of the server 110. The I/O interface(s) 1012 also connect to a display 1020.

[0072] The display 1020 provides a mechanism to display data to a user and may be, for example, a computer monitor.

[0073] The programs described herein are identified based upon the application for which they are implemented in a specific embodiment of the invention. However, it should be appreciated that any particular program nomenclature herein is used merely for convenience, and thus the invention should not be limited to use solely in any specific application identified and/or implied by such nomenclature.

[0074] The flowchart and block diagrams in the Figures illustrate the architecture, functionality, and operation of possible implementations of systems, methods, and computer program products according to various embodiments of the present invention. In

this regard, each block in the flowchart or block diagrams may represent a module, segment, or portion of instructions, which comprises one or more executable instructions for implementing the specified logical function(s). In some alternative implementations, the functions noted in the block may occur out of the order noted in the figures. For example, two blocks shown in succession may, in fact, be executed substantially concurrently, or the blocks may sometimes be executed in the reverse order, depending upon the functionality involved. It will also be noted that each block of the block diagrams and/or flowchart illustration, and combinations of blocks in the block diagrams and/or flowchart illustration, can be implemented by special purpose hardware-based systems that perform the specified functions or acts or carry out combinations of special purpose hardware and computer instructions.

[0075] Some portions of the present disclosure are explicitly or implicitly presented in terms of algorithms and functional or symbolic representations of operations on data within a computer memory. These algorithmic descriptions and functional or symbolic representations are the means used by those skilled in the data processing arts to convey most effectively the substance of their work to others skilled in the art. An algorithm is here, and generally, conceived to be a self-consistent sequence of steps leading to a desired result. The steps are those requiring physical manipulations of physical quantities, such as electrical, magnetic or optical signals capable of being stored, transferred, combined, compared, and otherwise manipulated.

[0076] Unless specifically stated otherwise, and as apparent from the following, it will be appreciated that throughout the present specification, discussions utilizing terms such as “determining”, “obtaining”, “displaying”, or the like, refer to the actions and processes of a computer system, or similar electronic device, that manipulates and transforms data represented as physical quantities within the computer system into other data similarly represented as physical quantities within the computer system or other information storage, transmission or display devices.

[0077] The present specification also discloses a system (which may also be embodied as a device or an apparatus) for performing the operations/functions of the methods described herein. Such a system may be specially constructed for the required purposes, or may comprise a general-purpose computer or other device selectively activated or

reconfigured by a computer program stored in the computer. The algorithms presented herein are not inherently related to any particular computer or other apparatus. Various general-purpose machines may be used with computer programs in accordance with the teachings herein. Alternatively, the construction of more specialized apparatus to perform
5 the required method steps may be appropriate.

[0078] In addition, the present specification also at least implicitly discloses a computer program or software/functional module, in that it would be apparent to the person skilled in the art that the individual steps or operations of the methods described herein may be put into effect by computer code. The computer program is not intended to be
10 limited to any particular programming language and implementation thereof. It will be appreciated that a variety of programming languages and coding thereof may be used to implement the teachings of the disclosure contained herein. Moreover, the computer program is not intended to be limited to any particular control flow. There are many other variants of the computer program, which can use different control flows without departing
15 from the spirit or scope of the invention.

[0079] Furthermore, one or more of the steps or operations of a computer program/module or method described herein may be performed in parallel rather than sequentially. Such a computer program may be stored on any computer readable medium. The computer readable medium may include storage devices such as magnetic or optical
20 disks, memory chips, or other storage devices suitable for interfacing with a general-purpose computer. The computer program when loaded and executed on such a general-purpose computer effectively results in an apparatus that implements the steps or operations of the methods described herein.

[0080] In various embodiments, there is provided a computer program product, embodied in one or more computer-readable storage mediums (non-transitory computer-readable storage medium), comprising instructions executable by one or more computer
25 processors to perform a method 200 of providing feedback to a user as described hereinbefore with reference to FIG. 2. Accordingly, various computer programs or modules described herein may be stored in a computer program product receivable by a system (e.g.,
30 a computer system or an electronic device) therein, such as the server 110, or client devices

130a-130b as shown in FIG. 1, for execution by at least one processor to perform the required or desired functions.

[0081] While embodiments of the invention have been particularly shown and described with reference to specific embodiments, it should be understood by those skilled
5 in the art that various changes in form and detail may be made therein without departing from the scope of the invention as defined by the appended claims. The scope of the invention is thus indicated by the appended claims and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced.

CLAIMS

1. A computer-implemented method of providing feedback to a user using at least one
5 processor, the method comprising:

obtaining configuration data in relation to a plurality of items for a game, wherein
the configuration data indicates an item promotion associated to each item of the plurality
of items;

10 obtaining behavior data in relation to game behavior of the user with respect to a
game session of the game;

determining at least one feedback item for the user based on the behavior data in
relation to the game behavior of the user in accordance with the configuration data, wherein
the at least one feedback item corresponds to one or more items of the plurality of items
available to the user and one or more associated item promotions, respectively; and

15 displaying a user interface to the user based on the at least one feedback item, the
user interface is indicative of a performance of the user during the game session, and
comprises at least one feedback element corresponding to the at least one feedback item to
be selected by the user.

20 2. The method of claim 1, wherein the behavior data of the user comprises a plurality
of game behavior indicators corresponding to a plurality of configuration parameters,
respectively, with respect to the game session of the game.

3. The method of claim 2, wherein the configuration data further indicates a plurality
25 of predetermined conditions associated to the plurality of configuration parameters,
respectively, for the plurality of items to be available to users of the game; and said
determining at least one feedback item for the user based on the behavior data in relation
to the game behavior of the user in accordance with the configuration data is based on the
plurality of the game behavior indicators satisfying the plurality of predetermined
30 conditions, respectively.

4. The method of claim 2 or 3, wherein the plurality of configuration parameters comprises a match mode, a game mode, a group mode of the user, a type of game map, a ranking of the player with respect to the game session, duration of the game session, existing items owned by the user, pass status and payment level of the user.

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5. The method of any one of claims 1 to 4, wherein determining the at least one feedback item for the user is further based on a user group with which the user is associated.

6. The method of claim 5, further comprising generating group information for a plurality of users using machine learning, the group information comprising the user group with which the user is associated.

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7. The method of any one of claim 5 or 6, further comprising generating group information for a plurality of users using rules, the group information comprising the user group with which the user is associated.

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8. The method of any one of claims 1 to 7, wherein the configuration data further comprises, for each item of the plurality of items, a drop rate and a weight associated to the item.

20

9. The method of claim 8:

wherein said determining at least one feedback item for the user based on the behavior data in relation to the game behavior of the user in accordance with the configuration data comprises determining a plurality of feedback items for the user, wherein the plurality of feedback items for the user correspond to a subset of items of the plurality of items available to the user in a bundle pool and associated item promotions, respectively;

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further comprising selecting the at least one feedback item from the plurality of feedback items based on the drop rate and the weight associated to each item of the subset of items; and

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said displaying a user interface to the user is further based on the at least one feedback item selected.

10. The method of any of the preceding claims, wherein said obtaining behavior data
5 in relation to game behavior of a user with respect to a game session of a game is performed after the user exits the game session.

11. The method of any of the preceding claims, wherein said displaying a user interface
10 to the user is performed after completing the game session of the game.

12. The method of any of the preceding claims, further comprising releasing the at least one feedback element corresponding to at least one feedback item to be selected by the user for a predetermined duration of time.

13. A feedback system for providing feedback to a user, the system comprising:
15 a memory; and
at least one processor communicatively coupled to the memory and configured to:
obtain configuration data in relation to a plurality of items for a game,
wherein the configuration data indicates an item promotion associated to each item
20 of the plurality of items;
obtain behavior data in relation to game behavior of the user with respect to a game session of the game;
determine at least one feedback item for the user based on the behavior data in relation to the game behavior of the user in accordance with the configuration
25 data, wherein the at least one feedback item corresponds to one or more items of the plurality of items available to the user and one or more associated item promotions, respectively; and
display a user interface to the user based on the at least one feedback item, the user interface is indicative of a performance of the user during the game session,
30 and comprises at least one feedback element corresponding to the at least one feedback item to be selected by the user.

14. The system of claim 13, wherein the behavior data of the user comprises a plurality of game behavior indicators corresponding to a plurality of configuration parameters, respectively, with respect to the game session of the game.

5

15. The system of claim 14, wherein the configuration data further indicates a plurality of predetermined conditions associated to the plurality of configuration parameters, respectively, for the plurality of items to be available to users of the game; and said determining at least one feedback item for the user based on the behavior data in relation to the game behavior of the user in accordance with the configuration data is based on the plurality of the game behavior indicators satisfying the plurality of predetermined conditions, respectively.

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16. The system of claim 14 or 15, wherein the plurality of configuration parameters comprises a match mode, a game mode, a group mode of the user, a type of game map, a ranking of the player with respect to the game session, duration of the game session, existing items owned by the user, pass status and payment level of the user.

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17. The system of any one of claims 13 to 16, wherein determining the at least one feedback item for the user is further based on a user group with which the user is associated.

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18. The system of claim 17, further comprising generating group information for a plurality of users using machine learning, the group information comprising the user group with which the user is associated.

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19. The system of claims 17 or 18, further comprising generating group information for a plurality of users using rules, the group information comprising the user group with which the user is associated.

20. A computer program product, embodied in one or more non-transitory computer-readable storage mediums, comprising instructions executable by at least one processor to perform a method of providing feedback to a user, the method comprising:

5 obtaining configuration data in relation to a plurality of items for a game, wherein the configuration data indicates an item promotion associated to each item of the plurality of items;

obtaining behavior data in relation to game behavior of the user with respect to a game session of the game;

10 determining at least one feedback item for the user based on the behavior data in relation to the game behavior of the user in accordance with the configuration data, wherein the at least one feedback item corresponds to one or more items of the plurality of items available to the user and one or more associated item promotions, respectively; and

15 displaying a user interface to the user based on the at least one feedback item, the user interface is indicative of a performance of the user during the game session, and comprises at least one feedback element corresponding to the at least one feedback item to be selected by the user.