[0003] The known system and the known method primarily serve for reducing the water consumption of sanitary facilities. For making the decision what to do and not to do in the individual case, there is however the need for at least one person, who evaluates statistics and for example decides, how to reduce the water consumption of a sanitary device at times of high usage, when to activate a cleaning mode or to initiate a service call. Particularly with larger sanitary facilities, this involves great effort which is hardly feasible, so that the resources which are generally available in a sanitary facility, for example with regard to water saving, cannot be used with the previous system and the corresponding method.

[0004] Embodiments of the present invention seek to advance the system and the method of that type in such a way that the efficiency regarding the water consumption of a sanitary facility can be further increased with the same or even less effort.

[0005] An aspect of the present invention provides a sanitary facility management system with at least one sanitary installation, which is coupled to a water supply and/or is included in a water circuit and on which at least one operating value of the at least one sanitary installation is recorded in the form of data, a sanitary facility control device connected to the at least one sanitary installation, comprising at least one data transmitter and at least one signal receiver, and a data processing and signal output system communicating with the sanitary facility control device via the at least one data transmitter and the at least one signal receiver, wherein the data processing and signal output system is a system learning by machine and/or a system comprising an artificial neuronal net and/or an expert system wherein the at least one operating value is transmitted by the at least one data transmitter to the data processing and signal output system, wherein the data processing and signal output system processes the at least one operating value to generate at least one signal, and transmits the at least one signal to the at least one signal receiver, wherein the data processing and signal output system processes the transmitted data and the at least one signal generated as a function thereof, analyzes a current preceding method runs, derives from this at least one rule and/or an algorithm for optimizing the at least one operating value of the at least one sanitary installation, depending on the currently transmitted data and the at least one rule and/or the at least one algorithm generates the at least one signal as a current signal and transmits the current signal to the at least one signal receiver, wherein the machine learning of the data processing and signal output system is supervised, whereby the data processing and signal output system is trained with predefined data, and/or is unsupervised, and wherein the data processing and

signal output system continuously learns and/or is strengthened on the basis of the data obtained, and receives feedback as to whether the learning has led to success.

[0006] Preferably, the data processing and signal output system comprises at least one regulation and/or a classifier trained with methods of artificial intelligence.

[0007] The sanitary facility management system according to the invention can comprise a system as a data processing and signal output system that is machine learning or self-learning. The machine learning of the data processing and signal output system used according to the invention can take place supervised (described as supervised learning in English), wherein the data processing and signal output system is trained with pre-defined data, and/or it can take place unsupervised (described as unsupervised learning in English), wherein the data processing and signal output system continuously learns based on the transferred data during operation, and/or it can take place reinforced (described as reinforcement learning in English), wherein the data processing and signal output system receives a feedback or response from at least one other

as a mesh network. A wireless network such as a Bluetooth mesh can for example be used here. The network sensor can be a basic sensor, too. In these embodiments of the sanitary facility management system according to the invention, a decentralized system is used in which the basic sensors and the network sensors communicate directly among each other and decisions can be made in the net (mesh). That means, one of the basic sensors or one of the network sensors can make decisions based on the operating data captured by other basic sensors or network sensors situated in the net.

[00014] Another aspect of the present invention provides a sanitary facility management method, in which with a sanitary facility with at least one sanitary installation, which is supplied with water and/or through which water flows and on which at least one operating value of the at least one sanitary installation is recorded in the form of data, the at least one operating value is transmitted to a data processing and signal output system with at least one data transmitter of a sanitary facility control device connected to the at least one sanitary installation, the data processing and signal output system processes the at least one operating value, at least one signal is generated in accordance therewith and the generated at least one signal is transmitted to at least one signal receiver of the sanitary facility control device, and in which the data processing and signal output system learns by machine and/or generates the at least one signal by using an artificial neuronal net and/or an expert system wherein the data processing and signal output system analyzes the data transferred in a current process cycle and the generated at least one signal in process cycles respectively preceding the current process cycle, deduces at least one rule and/or an algorithm for an optimization of the at least one operating value of the at least one sanitary installation, generates the at least one signal as a current signal based on the currently transmitted data and the at least one rule and/or the at least one algorithm, and transmits the current signal to the at least one signal receiver, wherein the machine learning of the data processing and signal output system is supervised, whereby the data processing and signal output system is trained with predefined data, and/or is unsupervised, and wherein the data processing and signal output system continuously learns and/or is strengthened on the basis of the data obtained, and receives feedback as to whether the learning has led to success.

[00015] The machine learning of the data processing and signal output system can take place supervised (supervised learning), wherein the data processing and signal output system is trained with pre-defined data, and/or it can take place unsupervised (unsupervised learning), wherein the data processing and signal output system continuously learns during operation based on the

transmitted data, and/or it can take place reinforced (reinforcement learning), wherein the data processing and signal output system receives a feedback or response of at least another part and/or at least one user of the sanitary facility management system, whether the learning has led to a success.

[00016] In preferable embodiments of the method according to the invention, it works based on an artificial neuronal net. An expert system, that is a computer program which makes decisions based on a knowledge base, can be used alternatively or in addition thereto with the method according to the invention.

CLAIMS

1. A sanitary facility management system with at least one sanitary installation, which is coupled to a water supply and/or is included in a water circuit and on which at least one operating value of the at least one sanitary installation is recorded in the form of data, a sanitary facility control device connected to the at least one sanitary installation, comprising at least one data transmitter and at least one signal receiver, and a data processing and signal output system communicating with the sanitary facility control device via the at least one data transmitter and the at least one signal receiver,

wherein the data processing and signal output system is a system learning by machine and/or a system comprising an artificial neuronal net and/or an expert system,

wherein the at least one operating value is transmitted by the at least one data transmitter to the data processing and signal output system,

wherein the data processing and signal output system processes the at least one operating value to generate at least one signal, and transmits the at least one signal to the at least one signal receiver,

wherein the data processing and signal output system processes the transmitted data and the at least one signal generated as a function thereof, analyzes a current preceding method runs, derives from this at least one rule and/or an algorithm for optimizing the at least one operating value of the at least one sanitary installation, depending on the currently transmitted data and the at least one rule and/or the at least one algorithm generates the at least one signal as a current signal and transmits the current signal to the at least one signal receiver,

wherein the machine learning of the data processing and signal output system is supervised,

whereby the data processing and signal output system is trained with predefined data, and/or is unsupervised, and

wherein the data processing and signal output system continuously learns and/or is strengthened on the basis of the data obtained, and receives feedback as to whether the learning has led to success.

2. A sanitary facility management system according to claim 1, wherein the data processing and signal output system is a computer or a mobile device with computer functionality and connectivity or an IT infrastructure available via the internet or a facility management system.

3. A sanitary facility management system according to claim 1 or 2, wherein a data and/or signal intermediate processing device is provided between the at least one data transmitter and the data processing and signal output system and/or between the at least one signal receiver and the data processing and signal output system.

4. A sanitary facility management system according to at least one of the preceding claims, wherein the data processing and signal output system is a meshed network comprising at least one basic sensor or an electronic control of one of the sanitary installations and at least one network sensor communicating with the at least one basic sensor or an electronic control of another of the sanitary installations.

5. A sanitary facility management method, in which with a sanitary facility with at least one sanitary installation, which is supplied with water and/or through which water flows and on which at least one operating value of the at least one sanitary installation is recorded in the form of data, the at least one operating value is transmitted to a data processing and signal output system with at least one data transmitter of a sanitary facility control device connected to the at least one sanitary installation, the data processing and signal output system processes the at least one operating value, at least one signal is generated in accordance therewith and the generated at least one signal is transmitted to the at least one signal receiver of the sanitary facility control device,

wherein the data processing and signal output system learns by machine and/or generates the at least one signal using an artificial neuronal net and/or an expert system,

wherein the data processing and signal output system analyzes the data transferred in a current process cycle and the generated at least one signal in process cycles respectively preceding the current process cycle, deduces at least one rule and/or an algorithm for an optimization of the at least one operating value of the at least one sanitary installation, generates the at least one signal as a current signal based on the currently transmitted data and the at least one rule and/or the at least one algorithm, and transmits the current signal to the at least one signal receiver,

wherein the machine learning of the data processing and signal output system is supervised,

whereby the data processing and signal output system is trained with predefined data, and/or is unsupervised, and

wherein the data processing and signal output system continuously learns and/or is strengthened on the basis of the data obtained, and receives feedback as to whether the learning has led to success.

6. A sanitary facility management method according to claim 5, wherein the data processing and signal output system machine learns at least one usage scenario from the data transmitted by the at least one data transmitter and the signal transmitted to the at least one signal receiver as well as the at least one rule and/or the at least one algorithm deduced in accordance therewith for the at least one sanitary installation, and optimizes a respective current signal in accordance with the at least one usage scenario.

7. A sanitary facility management method according to claim 6, wherein the data processing and signal output system automatically adjusts the at least one usage scenario with due regard to each process cycle.

8. A sanitary facility management method according to claim 5 or 6, wherein the data processing and signal output system automatically pre-calculates future operating values to be expected from the data transmitter by means of the at least one usage scenario.

9. A sanitary facility management method according to one of the claims 5 to 8, wherein the data processing and signal output system automatically groups the data transmitted by the data transmitter into correct and error indicating data in comparison to the at least one rule and/or the at least one algorithm.

10. A sanitary facility management method according to one of the claims 6 to 8, wherein the data processing and signal output system automatically groups the data transmitted by the data transmitter into correct and error indicating data in comparison to the at least one usage scenario.

11. A sanitary facility management method according to claim 9 or 10, wherein the data processing and signal output system
(a) initiates an action on the sanitary installation or its water supply in case of error indicating data and/or
(b) issues an assistance report and/or a notification.

12. A sanitary facility management method according to one of the claims 6 to 8, and 10, wherein with a sanitary facility, which comprises several of the at least one sanitary installation, the data processing and signal output system forms an installation model from the respective rules and/or algorithms and/or usage scenarios, in which both the operating values of all individual sanitary installations of the sanitary facility as well as their interactions with each other are included.

13. A sanitary facility management method according to one of the claims 5 to 12, wherein the sanitary facility control actively changes at least one operating parameter of the at least one sanitary installation after receiving the respective at least one signal by the at least one signal receiver.

14. A sanitary facility management method according to one of the claims 5 to 13, wherein the sanitary facility control issues at least one assistance report after receiving the respective at least one signal by the at least one signal receiver.

15. A sanitary facility management method according to one of the claims 5 to 14, wherein the data processing and signal output system receives data from a water supply and/or a waste water disposal of the sanitary facility and processes them for generating the at least one signal.

16. A sanitary facility management method according to one of the claims 5 to 15, wherein the data processing and signal output system receives external data from at least one additional sensor and/or a control that is not part of the sanitary facility and/or from at least one further data source that is not part of the sanitary facility, and includes the external data in the deduction of the at least one rule and/or the at least one algorithm.

17. A sanitary facility management method according to one of the claims 6 to 8, 10 and 12, wherein the data processing and signal output system receives external data from at least one additional sensor and/or a control that is not part of the sanitary facility and/or from at least one further data source that is not part of the sanitary facility, and includes the external data in the deduction of the at least one usage scenario.