

**Digital Information System****TECHNICAL FIELD**

The present invention relates to a method and to an arrangement of inserting or dividing a 24 hour cyclic exposure list in time slots and of assigning an information-category and a priority of exposure for spots or blocks of information for controlling and coordinating projectors in a digital information system for displaying information on at least one display device through the medium of at least one projector for each said device, said information being displayed in places that are accessible to and/or frequented by a general public. In one particular aspect, the invention is applied to control projectors for displaying information directed towards people in such places as main railway stations, subway stations, airport waiting lounges, cinemas, private homes etc.

**DESCRIPTION OF THE BACKGROUND ART**

From the Swedish patent publication SE-C2-507 473 and from the international publication WO 97/41546, hereby incorporated by reference, both by the same applicants as for the present invention a flexible system is known in which external information mediators are able to dynamically control in real time the transmission of display instructions to a larger public in different places situated at any chosen distance apart through projectors which project information onto displays intended herefor.

One object of the known system is to enable pictures, images, messages and announcements to be configured in accordance with modern digital technology, therewith providing rapid communication. A further object of it is to enable a picture, image or other information to be changed in practice as often as is desired, in real time, therewith providing direct and immediate communication, and to enable similar or specific information to be displayed in places that are mutually far apart and to enable message information to be alternated with advertising spots, for instance.

According to one aspect, the known system relates to a method of coordinating and controlling projectors in a digital information system for displaying information on a display device through the medium of a projector, whereby the information being displayed in places that are generally available to and frequented by a general public.

Information display subscribers are connected to a computerized control centre via computer and telecommunication interfaces for all-day-round transmission of information. The control centre has a communication interface against computerized devices situated in connection with said places for projector coordination and control.

The control centre is able to create and update a display/play/exposure list in real time with control instruction fields via booking information for display dynamically in time from mediators

having drive routine means which are connected to the subscription and which are transparent for the transmission of information to the drive routine means of the control centre for transmission of information in the system.

5 A display list includes control instructions, which coordinate and control the projectors concerned with regard to what shall be displayed, when it shall be displayed, where it shall be displayed and for how long it shall be displayed, and causes projectors, independently of other projectors, to receive the same or different information for display in accordance with the display list.

10 An administrator of the digital information system is able to update the display list with desired information at any time whatsoever, wherein the dynamic booking can be changed or delayed.

The projector may also interrupt display of information when the allocated display devices, or the projector, is/are visually obstructed in said public place

15 In one embodiment, the exposure list may include reserved instruction fields for updating with control instructions via the mediator interface, wherein the control instructions can be placed in a waiting line, or queue, when the exposure list lacks instruction updating fields at that moment in time.

20 The known system also relates to an arrangement of apparatus for carrying out the aforesaid method, said apparatus including the aforesaid devices and an exposure handler which creates the exposure list.

Prior art, prior to the Swedish patent publication SE-C2-507 473 and the international publication WO 97/41546, did not consider or propose the use of a display or play or exposure list. Hence such prior art displays blocks of different information which, for example, are of the length of 1 hour which are in principal repeated each hour. If new information is to be displayed 25 the block of information has to be revised, which can be accomplished in many different ways, no one of them sufficiently disclosed through prior art. Those prior art systems are very time consuming in introducing new blocks of information and do not at all have the inherent dynamic introduced by a display list for a possible 24-hour cyclic display at various time periods. Also, such a display list makes it impossible to repeatedly re-transmit blocks of information.

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It is a drawback with prior art dynamic display lists to inhibit other mediators from booking information in adjacent spots of information, both before and after ordered information in the list, with information of the same category. Hence it is a problem to sort the display list in a favourable fashion for mediators and the system itself.

A freely organised display list, i.e., one where time periods for display are ordered arbitrary creates problems in keeping track of the booked information, statistics, and in billing for display time etc.

Another drawback and problem related to the known system described in said patent and application respectively, is that the play list is unevenly used for displaying ordered spots/blocks of information from mediators. If for example a projector interrupts display of information when the allocated display devices, or the projector, is/are visually obstructed in said public place, information, for example by an incoming train, spots/blocks of that piece of information should be displayed at another suitable time period according to the display/play/exposure list. This is not an easy task to accomplish in order to implement fairness and other parameters controlling the willingness of mediators to use a system like that.

There are more events to even out at, for example, a subway station such as failing projectors/cameras/digital displays, emergency messages shown on displays, time table displays etc.

Therefore effective methods or schemes and arrangements are needed to solve problems related to the above.

#### SUMMARY OF THE DISCLOSED INVENTION

It is an aspect of the present invention to solve problems related to inserting spots or blocks of information in a digital information system and assigning an information-category and a priority of exposure for spots or blocks of information for controlling and coordinating projectors in a digital information system controlled or partly controlled by a display or play or exposure list or the like in accordance with attached independent claims and embodiments of the present invention as set forth through attached dependent claims.

In order to accomplish the aforesaid the present invention sets forth a method of inserting spots or blocks of information in a digital information system comprising interfaces for data and telecommunication for possible cyclic repeatable 24 hour. The method comprising coordinating and controlling of projectors for exposing information on at least one display device through the medium of at least one projector, wherein the information is displayed in places accessible to and frequented by a general public or on television. Subscribing information mediators are connected to a computerized control centre via interfaces for data and telecommunication for round-the clock transmission of information. The control centre has communication interfaces against computerized devices situated in connection with said places for coordinating and controlling projectors/cameras/digital displays. Said control centre is able to create and update an exposure list in real time with control instruction fields via dynamic booking of information in time for exposure from mediators.

Mediators having drive routine means connected to the subscription, which may be transparent for transmission of information with the drive routine means of the control centre for transmission of information in the system via interfaces. The exposure list with control instructions coordinates and controls the projectors with regard to what shall be exposed, when it shall be exposed, where it shall be exposed and for how long it shall be exposed, and enables each projector to be controlled. This can be achieved independently of the other projectors, to receive the same or different information in accordance with the exposure list for exposure of respective projectors through the computerized devices.

This is accomplished by the exposure list being divided into a plurality of time slots of at least one specific length of time, thus as one preferred option facilitating a system organisation of sorting of the information to be displayed.

Category classification and priority assignment is accomplished in one embodiment of the invention by determining how many times an information is to be exposed during a specific time period, e.g. one day, a week etc., for example, when booked, whereby single spots or blocks (in time slots) of information are assigned a specific information-category and a priority for exposure. The priority decrements a specific unit of priority for each exposure, displaying said information according to assigned priority, thus exposure interruption due to visual inaccessibility for information viewers is evened out during said specific time period for single spot or block information.

In one embodiment each time slot is assigned a specific category of information.

Another embodiment includes that time slots in series, booked with the same information sequence, are assigned the same category of information, whereby a time slot following the series is assigned a different category.

One embodiment of the present invention comprises that information assigned a specific information-category is exposed with at least one different information-category between themselves. Said specific information category can be given a specific code of placement in the exposure list.

Yet another embodiment includes that priority is equal for every new information entry into the system.

A further embodiment includes that priority decrements with the priority figure divided with all the entries of a specific information spot or block preferably rounded or truncated if the division is an infinite decimal figure.

A still further embodiment comprises that said single information spot or block with the highest priority level is exposed, and that information spots or blocks which priority has reached the level of no priority left are abandoned from exposure.

Another embodiment comprises that information spots or blocks are exposed in series if they have the same priority.

Yet another embodiment includes information spots or blocks having higher priority than zero or the like and the same information-category, a system choice information is played  
5 between each information of the same category.

In addition the present invention comprises an arrangement for inserting spots or blocks of information in a digital information system comprising interfaces for data and telecommunication for possible cyclic repeatable 24 hour transmission in accordance with the above described system further comprising:

10 assigning means dividing the exposure list into a plurality of time slots of at least one specific length of time; and

organising means which as one preferred option facilitates said system to sort categories of the information in time slots to be displayed.

Said arrangement in one embodiment of the present invention further comprising:

15 determining means determining how many times an information is to be exposed during a specific time period when booked;

category assigning means, whereby single spots or blocks of information are assigned a specific information-category;

priority assigning means for priority of exposure for an information;

20 computing means for decrement of priority a specific unit of priority for each exposure, displaying said information according to assigned priority; and

thus enabling that exposure interruption due to visual inaccessibility for information viewers is evened out during said specific time period for a single spot or block of information.

In one embodiment each time slot is assigned a specific category of information by the  
25 assigning means.

Another embodiment includes that time slots in series, booked with the same information sequence, are assigned the same category of information by the organising means, whereby a time slot following the series is assigned a different category.

Information assigned a specific information-category in one embodiment is exposed  
30 through the system with at least one different information-category between themselves.

Said specific information category is given a specific code of placement in the exposure list by said category assigning means in one embodiment.

The priority is equal for every new information entry into the system in one embodiment.

In one embodiment the priority decrements with the priority figure divided with all the entries of a specific information spot or block preferably truncated if the division is an infinite decimal figure through said computing means.

5 A single information spot or block with the highest priority level is exposed, and information spots or blocks which priority has reached a level of no priority left are abandoned from exposure by the system in another embodiment of the invention.

Information spots or blocks are exposed in series by the system if they have the same priority in one embodiment of the arrangement.

10 In yet another embodiment, said information spots or blocks having higher priority than zero or the like and the same information-category, a system choice information is exposed by the system between each information of the same category.

### BRIEF DESCRIPTION OF THE DRAWINGS

The following description makes reference to the text in the accompanying drawings to provide a better understanding of the embodiments of the present invention, whereby:

15 Fig. 1 schematically illustrating a prior art system for coordinating and controlling projectors in a digital information system for displaying information in accordance with the invention;

### Tables

20 Table 1 is schematically illustrating a display list divided into time slots according to the present invention.

Table 2 is schematically illustrating a display list implemented through the present invention.

### DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS OF THE INVENTION

25 The present invention relates to a method of assigning time slots, information-category and a priority of exposure for spots or blocks of information for the dynamic coordination and control of projectors in a digital information system for displaying information on at least one display device via at least one projector for each display device, wherein the information is displayed in places that are accessible to and frequented by a general public. The invention also relates to an arrangement of apparatus for carrying out the method.

30 From the Swedish patent publication SE-C2-507 473 and from the international publication WO 97/41546, both by the same applicants as for the present invention, such a dynamic system is known.

35 An aspect of the present invention is to solve problems relating to prior art dynamic display lists in order to inhibit other mediators from booking information in adjacent time slots, both

before and after ordered information in the list, with information of the same category. Hence it is a problem to sort the display list in a favorable fashion for mediators and the system itself.

5 A freely organized display list, i.e., one where time periods for display are ordered arbitrary creates problems in keeping track of the booked information, making statistics, and in billing for display time etc.

The present invention also describes and claims how to make use of a display/play/exposure list according to a dynamic system in order to overcome disadvantages related to unexposed information spots or blocks in the list.

10 Prior art, prior to the Swedish patent publication SE-C2-507 473 and the international publication WO 97/41546, did not consider or propose the use of a display or play or exposure list. Hence such prior art displays blocks of different information which, for example, are of the length of 1 hour which are in principal repeated each hour. If new information is to be displayed the block of information has to be revised, which can be accomplished in many different ways,  
15 no one of them sufficiently disclosed through prior art. Those prior art systems are very time consuming in introducing new blocks of information and do not at all have the inherent dynamic introduced by a display list for a possible 24-hour cyclic display at various time periods. Also, the display list makes it impossible to repeatedly re-transmit blocks of information.

It is to be understood that a projector/camera itself can be a digital display device or  
20 incorporated in a digital display device such as an LCD-display or a plasma display device, a digital television set etc.

Although implementation of embodiments are limited in the following to subway railway stations, it will be understood that the invention is not restricted to these embodiments. As before mentioned, the inventive system can be used in places where large sections of the public are  
25 known to visit or look at advertisement, such as railway stations, airports, outdoor locations, cinemas, in homes looking at television etc., in addition to subway stations.

Preferred embodiments of the invention will now be described in detail with reference to the accompanying drawings, where Fig. 1 schematically illustrates a prior art system 10, as disclosed through patent publication SE-C2-507 473 and the international publication WO 97/41546, for  
30 coordinating and controlling projectors in a digital information system for displaying information on display devices, such as free-standing picture screens, wall-mounted screens, walls, and overhead screens or other means suitable for reproducing or exposing picture information in the form of text, stills, movable pictures, images, etc. (displays not shown in the drawing).

In the main, the system is comprised of a control center 12 having a communication  
35 interface 14 which connects an unlimited number of computerized devices 16, 18, 20 which are

placed at desired distances from one another for the control of projectors 22, or as mentioned other projectors such as LCD-display, TV-set 40 etc., whose projector images or pictures are displayed in the aforesaid public places.

Hence, in other embodiments of the devices included in the computerized devices 16, 18, 5 20, the projector 22 is replaced with an electronic display (not shown), such as a large picture screen in LCD technology, light-emitting diode technology (LED technology) plasma display techniques or the like. The station computer 34 is then included in the large picture screen or is connected externally thereto. Preferably, the projector computers 38 in the station computer 34 and the database 36 are also included. Information is transmitted from the control center 12 10 generally in the same manner as that before described. However, each separate large picture screen may be addressed directly through a radio network 14, wherein the screens are controlled from the control center 12 which includes redundancy. Thus, in the illustrated case, the computerized devices 16, 18, 20 form an electronic display with control computer 34, said projector 22 effecting the display.

15 The illustrated system also includes an advertising agency, which is connected to the control center 12 through the medium of a computer 24 and a modem 26 or the like. Although only one modem is shown connected to the central computer 28 of the control center, it will be understood that modem poles, telephone switching centers and other similar devices may be used to this end in accordance with present-day techniques. The advertising agency can also be a company for 20 digital reproduction (repro) of information to be inserted in an exposure list according to prior art. Alternatively control center 12 working stations 32 are both internal and/or external thus the external workstation(s) 32 make up or belong to said repro company. Hence information mediators 24 can order their information to be inserted by a external repro company.

The central computer 28 in the control center 12 also includes databases 30, in the illustrated 25 case two databases. The databases 30 may be externally connected to the central computer. The control center also includes working stations 32, which are preferably connected to the central computer 28 via a Local Area Network (LAN) in accordance with known techniques. The working stations 32 are used by the personnel serving the control center 12, in monitoring, checking, maintaining and updating functions in the central computer with its databases. The 30 control center administrator is able to insert projector control instructions via the working stations, for instance when information is directed specifically to travelers and passengers travelling by ship, train, subway, aircraft or some other vehicular traffic who require specific information. The information may concern the arrival times and departure times of passenger-carrying vehicles. The administrator controls internally how, what, when or where the 35 information shall be displayed by the projectors 22. An important feature in this context,

however, is that external information mediators 24 are able to give control instructions to the projectors 22 with regard to the information that the external mediators 24 desire the system 10 to display via the projectors 22, each on its own initiative and communication-wise transparent via modems 26. This can be achieved in accordance with one embodiment of the prior art invention without involving the working stations 32 in the procedure of transmitting the control instructions to the central computer 28.

The term information mediator 24 used in the following shall be interpreted in its widest meaning, i.e. as not only referring to advertising agencies but to all companies and private persons who wish to utilize the system 10 for commercial reasons or for the display of information that concerns a general public. At present a mediator which wishes to display information in public places is normally forced to wait about two weeks, perhaps longer, before his order can be implemented and the information publicly displayed. With the inventive digital information system 10, the information can be displayed principally in real time, i.e. at the time of making the order, possibly with a short delay due to processing, fully-booked exposure lists and other quickly passing causes. Furthermore, an external information mediator 24 is able to put through information to the system 10 twenty-four hours a day, whereupon the information can be included instantaneously in an exposure list, as illustrated in more detail below.

Those external information mediators which connect to the control center 12 via modems are, in one embodiment of the invention, connected to the control center via specially designed interfaces (drive routine means) for data and telecommunication. In this way, only external mediators 24 having the correct interface are able to connect transparently to the control center 12 for delivering control instructions to the projectors 22, which avoids unauthorized access to the display of such information and misuse of the system. In this regard, the special interface, which may be included in the computers of external mediators, also includes commercially available code keys or other codes sent between the control center 12 and the computer 24 of the external mediator to verify the right to enter control instructions into the central computer 28, without the administrator needing to supply through the working stations 32 further information or authority permitting access of the external information mediators 24 to the central computer for transmitting system transparent control instructions to the projectors 22.

In accordance with the prior art, the control center 12 has a communication interface 14 against the computerized devices 16, 18, 20 situated on shifting positions or places for projector coordination and control.

The drawing shows specifically a radio link which forms an interface between the control center 12 and the computerized devices 16, 18, 20, this interface being a preferred interface, although not necessarily the sole possible interface. Other interfaces for transmitting information

between the control center 12 and the computerized devices 16, 18, 20 may consist of a cable-carried ISDN solution (Integrated Services Digital Network) or other fixed lines that have like or better capacity.

5 The digital information system 10 has been described in the foregoing with regard to respective hardware and interfaces. Implementation of the prior art invention in achieving its objects and purposes has been described in detail in the publications SE-C2-507 473 and WO 97/41546 mentioned above.

10 Henceforth the present invention will be described through a prior art exposure list which covers a twenty-four hour period for information exposure or display via projectors 22. The exposure handler 3 collects and processes, i.e. allocates, information relating to projector control instructions, wherein mediator information is sorted into the exposure list in accordance with the wishes of the mediator 24 or its instructions, when available space is found in the exposure list or in alternative places in the exposure list given by the mediator. If the exposure list is completely filled with instructions, the mediator instructions to the control center remain in the queue list in  
15 the server 1 in readiness for later inclusion in the exposure list, in accordance with a preferred embodiment.

In one embodiment of the prior art, the exposure handler 3 creates or allocates a data message (data field) including a header, a control character field, an address field, optionally at least one CRC field (Cyclic Redundancy Code), and optionally status flags which identify and  
20 are connected to the information from an information mediator 24 and filed in the exposure list in the time interval that the information shall be exposed or displayed through a projector 22. This constitutes an alternative to the insertion of the entire information bit from an external mediator 24 in a specific time interval in the exposure list, and enables the provision of an exposure list that contains much less information and which is thus easier to handle, and to  
25 accelerate transmission of the list between computers and databases included in the system.

A data message in the exposure list can be understood here as being a control instruction in an instruction field for activating projectors 22 to project information.

A data message of this kind connected to each individual information exposure enables known HASH or switching methods to find information included in the exposure time intervals  
30 in the exposure list both effectively and quickly.

In one embodiment of the prior art, there is thus included an alternative to the dynamic updating of the exposure list as mentioned in the foregoing, i.e. the external information mediators 24 which do not have access to software in the exposure handler are provided with the possibility of having their picture material or exposure material processed by personnel serving  
35 the working stations 32, wherein said personnel enter, via the working stations 32, the

information that the external mediator 24 wishes to have exposed, or displayed, via projector control instructions in the exposure handler and via the exposure list created by the handler. Personnel at the working stations 32 are thus able to interrupt any queue lists in the server 1 to update the exposure list, via the exposure handler, with information generated centrally from the control center 12 or with information that is insufficiently processed when received by the server 1 from the external information mediator 24.

In accordance with the foregoing, external information mediators 24 that have access to the exposure program are able to deliver complete picture series/films which can be processed automatically and inserted into the exposure list, or optionally personnel administering the working stations 32 are able to pick external mediator information from the queues, or lines, and process this information so that it can be inserted into the exposure list via the exposure handler 3. In order to be able to distinguish information that must be processed via the working stations, external mediators 24 can mark or label such transmitted material with an appropriate code, so that the central computer 28 is able to identify this material and send it to working stations 32 for processing. Alternatively, e-mail is processed and registered as information which must be processed.

As mentioned, prior art, prior to the Swedish patent publication SE-C2-507 473 and the international publication WO 97/41546, did not consider or propose the use of a display or play or exposure list. Hence such prior art teaches displaying blocks of different information which, for example, are of the length of one hour which are in principal repeated each hour. If new information is to be displayed the block of information has to be revised, which can be accomplished in many different ways, non sufficiently or specifically disclosed through prior art. Those prior art systems are very time consuming in introducing new blocks of information and do not at all have the inherent dynamic introduced by a display list for a possible 24-hour display at various time periods. Also, the 24-hour display list makes it impossible to repeatedly re-transmit said, for example, 1 hour blocks of information.

Also, according to prior art, sensors may be placed in the close vicinity of projectors 22, such as to detect any obstacle that may prevent projectors 22 from displaying information on screens (not shown). These sensors are connected to projector computers 38, so as to enable said signals to be transmitted to the station computer 34. Alternatively, the sensors may be connected directly to station computers 34. The sensors are of a typical kind which detect the presence of obstacles, for instance optical sensors which detect when a light beam is broken, microphones, electromagnetic transmitters or ultrasonic transmitters having one or more receivers, etc.

When a sensor (not shown) registers the presence of an obstacle between a projector 22 and a cloth screen or some other display surface, the projector is stopped from projecting pictures during the time that the obstacle is present.

5 The sensor may also function to place a cover in front of the projector lens, so that dust, dirt or the like cannot come into contact with the lens or the display screen when the projector 22 is not a camera.

When the information mediator 24 is an advertising agency and the advertisements are to be displayed are in picture form, the advertising subscriber is able to buy a number of spots which are shown in the exposure list. The spots are shown, e.g., for a ten-second period, where, e.g.,  
10 each sixth spot is a spot used by the transport company operating the subway, wherein this spot can be used partly for advertising purposes and partly for information purposes. The advertising subscriber may buy spots individually or in a special package, and the digital information system is able to insert a change at short notice or to operate a completely new spot. The system is thus highly flexible and enables quick changes to be made with regard to what shall be exposed on  
15 the exposure means, where it shall be exposed and when.

Computer-produced pictures or exposures are delivered by external advertising agencies/newspaper agencies, etc., for exposure, or showing, in subways for instance. The pictures are received by a control center 12, which includes information material storage media. The control center also decides what shall be exposed and in which order, and distributes the  
20 information material to the subway station 16, 18, 20. The control center 12 is also able to refrain from displaying information which conflicts with "good order" or accepted morale and of a disturbing nature to the large majority of the public, possibly through the medium of working stations 32 and via control routines. The display of such information can also be prevented through the medium of the contracts signed by external information mediators 24 when obtaining  
25 an account or a subscription.

Those screens that are obstructed, e.g., by incoming subway trains, shall be "extinguished" during the time the train is located in the station. Synchronization in this regard is controlled by the station computer 34. This enables screens that are not obstructed to continue to receive exposure information from projectors 22.

30 The projector computer 38 informs the station computer 34 of the projector address, picture number/name, exposure duration and the time of the exposure, through the medium of function control means in said station computer. In the event of a malfunction/mains failure or a power cut, the station computer 34 reports this occurrence to the control center 12. The central computer 28, in turn, monitors the station computers 34 at regular intervals.

The information material to be exposed, or shown, is down-loaded from the control center 12 to the station computers 34. Because each projector 22 has its own projector computer 34, information material can be sent to the station computer 34 at any time in a calendar day without disturbing exposure on the station 16, 18, 20. When necessary, the exposure list can be changed  
5 or stopped in respect of all projectors 22 or in respect of certain projectors for showing specifically chosen information.

The computers 34 include counters which function to register, e.g. in tables or other registers, the length of time over which the information concerning each external information mediator 24 has been exposed, or shown. Thus, when so considered by an administrator, the  
10 mediator 24 need only pay for the actual time over which the information was displayed and is not required to pay a single down payment for, e.g., round-the-clock display over a seven-day period, as is at present the case.

A drive routine means which interrupts the showing of exposures when the exposure means is hidden from the projector 22, or vice versa, can also be used as feedback and monitoring in  
15 statistical analyses of the subway administrator in the present invention as to whether or not trains are running in accordance with the timetable, this being of interest for drawing up the exposure list and future updating of said list, among other things. This is effected by registration in the station computer 34 when a picture or exposure showing is interrupted. Registration may be effected, for instance, via interrupt routines for the computer 34. The registration may also  
20 trigger a clock (counter, timer) to register the time during which a vehicle obstructs the screen or the projector 22 respectively.

Illustrated in table 1 is a display list 50 divided into time slots in accordance with one embodiment of the present invention. A Display/play/exposure list 50 is divided into a plurality of time slots of at least one specific length of time, thus as one preferred option  
25 facilitating a system organization of sorting categories of the information to be displayed.

The columns in the display list 50 of Table 1 are marked up with the following headings: Time, Subject, Category, Priority and Expose, which should be fairly self explainable. Nevertheless, Expose is for how many times a certain subject should be exposed on a display.

As Table 1 aims to show how a display list 50 according to the present invention is  
30 arranged, only columns Time, Subject, and Category are explained for a better understanding of preferred embodiments of said list 50. The columns Priority and Expose are disclosed in detail below.

By arranging a cyclic 24 hour play list 50 it is essential that information belonging to the same subject and category can be sorted or arranged such that the information is not disclosed  
35 in series, i.e., directly after one another. Hence by assigning a time slot to a predetermined

time period in the play list 50, which time slot is of the length 10 seconds in the display list 50 of Table 1, column Time, each mediator 24 can choose a length of its information display in terms of series time slots, such as two ten second slots for Cars 1, three slots for Toothpaste, three slots for Cars 2, and three or more slots for Time Table and Poetry. More slots indicated  
5 by the star characters indicating a 24 hour cyclic list 50 in Table 1.

It is to be understood that time slots can be of arbitrary length, i.e. not only ten seconds long, but for example 5, 20, 25, 30 and so on. It is also possible to assign the display list 50 a plurality of time slots where the slots are of different length, for example, 10 and 20 seconds in a mixed embodiment.

10 A preferred embodiment comprises that a mediator order for a display in the list 50 assigns a category to ordered time slots. Thereby inhibiting another mediator from booking information in a time slot adjacent, both before and after ordered slots in the list 50, with information of the same category. By marking booked time slots with a category in the list 50 it is easy for the system to keep track of displayed information and to sort the display list 50 in  
15 a favorable fashion for mediators and the system itself.

A freely organized display list 50, i.e., one where time periods for display are ordered arbitrary creates problems in keeping track of the booked information, statistics, and in billing for display time.

In the embodiment shown through Table 1 and herein described, for example, the three  
20 commercials Cars 1, Toothpaste, and Cars 2 two of them Cars 1 and Cars 2 belong to the same category of commercials, here, for example, car manufactures. It is not likely that they would appreciate having their information spots played adjacent to each other. Therefore the system has organized it so that at least one time slot, here three slots 18.0020-18.0040 each of length 10 seconds, of another category is displayed between same categories. As is obvious  
25 from Table 1, the time slots are marked two digits for hours, two digits for minutes, and two digits for seconds.

Table 2 schematically depicts a display/play/exposure list 50 in order to explain and clarify some of the preferred embodiments of the present invention in greater detail.

The columns in Table 2 are marked up with the same headings as in Table 1: Time, Subject,  
30 Category, Priority and Expose. Expose is for how many times a certain subject should be exposed on a display. The schematic play list 50 comprises three subjects: cartoon, commercial, and information (here administrator information).

Two commercial spots are of the same category namely cars 1 and cars 2 and should preferably not being displayed in series (directly after another). The advertisements or spot cars 1

and cars 2 shall be exposed 2,00 and 3,00 times respectively. Decimal figures are provided because of possible rounding or truncation when computing new priorities.

As can be seen from Table 2 the priority unit used for a new entry into the display list 50 is 1,00. For simplicity, all of the entries around time slot 00 (the seconds part) in 18.0000 hours are new ones thus being given priority 1,00. At 19.0000 hours they are to be displayed once again. As can be seen the entries in the list 50 have new priority figures, calculated out off 1,00- (Priority/Expose). Priority figures and priority calculations can of course be accomplished in various ways, this being a possible one.

It is seen in Table 2 that cars 1 spot, an entire display, not necessarily only one time slot, has been forced to give up its display time 19.0010 for display of for example administrator information, here time table information. Hence, cars 1 spot priority is not to be decrement. Instead the cars 1 spot takes the place of the cars 2 spot display in the 20.0000 hour display because its priority 0,5 is now higher then the cars 2 priority 0,33.

It is preferable in one embodiment that the same categories of information are not to be displayed one after another, thus moderating the competition amongst for example two different car manufactures cars 1 and cars 2, and for other possible reasons.

In one embodiment of the play list 50 every time period for displaying information spots can have a category assigned to it, for example, so that toothpaste commercials and other categories are shown at specific time slots controlled by the display list 50. Hereby hindering a display of for example three toothpaste commercials in a row.

As is obvious from the display list 50 depicted in Table 2, the single dots or star characters on the rows of column Time indicate a cyclic display list 50. But not meaning that displays are repeated cyclic every time a block of information has been displayed, if the 18.0000-20.0000 hours displays in Table 1 are considered as blocks. This also elucidates that there is a big difference between prior arts constant block displays and the cyclic display list 50 introduced through publications SE-C2-507 473 and WO 97/41546.

Hence it is determined how many times an information is to be exposed through the control of the display list 50 during a specific time period preferably when booked, whereby single spots or blocks of information are assigned a specific information-category and a priority for exposure. The priority decrements a specific unit of priority for each exposure, thus exposure interruption due to visual inaccessibility for information viewers is evened out during said specific time period for single spot or block information.

A specific information category is given a specific code of placement in the exposure list 50 in one embodiment of the invention.

It is common to arrange so that single information spots or blocks with the highest priority level are exposed, and that information spots or blocks which priority has reached the level of no priority left are abandoned for exposure.

It is also preferred that information spots or blocks having higher priority than zero or the like, and the same information-category are not brought to contest. Instead a system choice information is played between each information of the same category. It may be a cartoon or any other information decided by the system.

In addition the present invention also comprises an arrangement for the assigning of an information-category and a priority of exposure for spots or blocks of information in a digital information system in accordance with the above described system with a display list 50, and further comprising:

determining means determining how many times an information is to be exposed during a specific time period;

category assigning means, whereby single spots or blocks of information are assigned a specific information-category;

priority assigning means for priority of exposure for an information;

computing means for decrement of priority a specific unit of priority for each exposure, displaying said information according to assigned priority; and

thus enabling that exposure interruption due to visual inaccessibility for information viewers is evened out during said specific time period for a single spot or block of information.

Information assigned a specific information-category in one embodiment is exposed through the system with at least one different information-category between themselves.

Said specific information category is given a specific code of placement in the exposure list 50 by said category assigning means in one embodiment.

It is well known to a person skilled in the art how to accomplish those means used in the arrangement described above. It is appreciated that such means are accomplished as software, hardware and/or firmware in the system described through publications SE-C2-507 473 and WO 97/41546.

It will be understood that the aforescribed embodiments of the present invention are not intended to limit the scope of the invention, but are merely intended as preferred modes of carrying out the invention. The invention includes other embodiments apparent to the person skilled in this art from the scope of the following Claims.

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Table 1

| Time    | Subject     | Category   | Priority | Expose |
|---------|-------------|------------|----------|--------|
| *       | -           | -          | -        | -      |
| *       | -           | -          | -        | -      |
| *       | -           | -          | -        | -      |
| 18.0000 | Commercial  | Cars 1     | -        | -      |
| 18.0010 | Commercial  | Cars 1     | -        | -      |
| 18.0020 | Commercial  | Toothpaste | -        | -      |
| 18.0030 | Commercial  | Toothpaste | -        | -      |
| 18.0040 | Commercial  | Toothpaste | -        | -      |
| 18.0050 | Commercial  | Cars 2     | -        | -      |
| 18.0100 | Commercial  | Cars 2     | -        | -      |
| 18.0110 | Commercial  | Cars 2     | -        | -      |
| 18.0120 | Information | Time Table | -        | -      |
| 18.0130 | Information | Time Table | -        | -      |
| 18.0140 | Information | Time Table | -        | -      |
| *       | -           | -          | -        | -      |
| *       | -           | -          | -        | -      |
| *       | -           | -          | -        | -      |
| 00.0000 | Midnight    | Poetry     | -        | -      |
| 00.0010 | Midnight    | Poetry     | -        | -      |
| 00.0020 | Midnight    | Poetry     | -        | -      |
| 00.0030 | Midnight    | Poetry     | -        | -      |
| *       | -           | -          | -        | -      |
| *       | -           | -          | -        | -      |
| *       | -           | -          | -        | -      |

**Table 2**

| Time    | Subject     | Category   | Priority | Expose |
|---------|-------------|------------|----------|--------|
| *       | -           | -          | -        | -      |
| *       | -           | -          | -        | -      |
| *       | -           | -          | -        | -      |
| 18.0000 | Cartoon     | Pleasure   | 1,00     | 5,00   |
| 18.0010 | Commercial  | Cars 1     | 1,00     | 2,00   |
| 18.0020 | Commercial  | Toothpaste | 1,00     | 5,00   |
| 18.0030 | Commercial  | Cars 2     | 1,00     | 3,00   |
| *       | -           | -          | -        | -      |
| *       | -           | -          | -        | -      |
| *       | -           | -          | -        | -      |
| 19.0000 | Cartoon     | Pleasure   | 0,80     | 5,00   |
| 19.0010 | Information | Time Table | -        | -      |
| 19.0020 | Commercial  | Toothpaste | 0,80     | 5,00   |
| 19.1030 | Commercial  | Cars 2     | 0,67     | 3,00   |
| *       | -           | -          | -        | -      |
| *       | -           | -          | -        | -      |
| *       | -           | -          | -        | -      |
| 20.0000 | Cartoon     | Pleasure   | 0,60     | 5,00   |
| 20.0010 | Information | Time Table | -        | -      |
| 20.0020 | Commercial  | Toothpaste | 0,60     | 5,00   |
| 20.0030 | Commercial  | Cars 1     | 0,50     | 2,00   |
| *       | -           | -          | -        | -      |
| *       | -           | -          | -        | -      |
| *       | -           | -          | -        | -      |

## CLAIMS

1. A method for inserting spots or blocks of information in a digital information system (10) comprising interfaces for data and telecommunication (26) for possible cyclic repeatable 24 hour  
5 transmission of information at places accessible to and frequented by a general public including places where television sets are placed, wherein a control centre (12) has communication interfaces (14) for coordinating and controlling projectors (22), wherein the control centre (12) is able to create and update an exposure list (50) in real time with control instruction fields via dynamic booking of information in time for exposure from mediators (24), wherein the exposure  
10 list (50) with control instructions coordinates and controls the projectors (22) with regard to what shall be exposed, when it shall be exposed, where it shall be exposed and for how long it shall be exposed, and enables each projector (22) to be controlled, independently of the other projectors, to receive the same or different information in accordance with the exposure list (50) for exposure of respective projectors (22), **characterized** in that the exposure list is divided into a  
15 plurality of time slots of at least one specific length of time, thus as one preferred option facilitating a system organisation of sorting of the information to be displayed.

2. A method according to claim 1, **characterized** in that each time slot is assigned a specific category of information.

3. A method according to claim 1 or 2, **characterized** in that time slots in series booked  
20 with the same information sequence are assigned the same category of information, whereby a time slot following the series is assigned a different category.

4. A method according to claims 1-3, **characterized** in that information assigned a specific information-category is exposed with at least one different information-category between themselves.

25 5. A method according to claims 1-4, **characterized** in that said specific information category is given a specific code of placement in the exposure list (50).

6. A method according to claims 1-5, **characterized** in that said priority is equal for every new information entry into the system.

7. A method according to claims 1-6, **characterized** in that said priority decrements with  
30 the priority figure divided with all the entries of a specific information spot or block preferably truncated if the division is an infinite decimal figure.

8. A method according to claims 1-7, **characterized** in that said single information spot or block with the highest priority level is exposed, and that information spots or blocks which priority has reached the level of no priority left are not exposed anymore.



9. A method according to claims 1-8, **characterized** in that said information spots or blocks are exposed in series if they have the same priority.

10. A method according to claims 1-9, **characterized** in that said information spots or blocks having higher priority than zero or the like and the same information-category, a system  
5 choice information is played between each information of the same category.

11. An arrangement for inserting spots or blocks of information in a digital information system (10) comprising interfaces for data and telecommunication (26) for possible cyclic repeatable 24 hour transmission of information at places accessible to and frequented by a general public including places where television sets are placed, wherein a control centre (12)  
10 has communication interfaces (14) for coordinating and controlling projectors (22), wherein the control centre (12) is able to create and update an exposure list (50) in real time with control instruction fields via dynamic booking of information in time for exposure from mediators (24), wherein the exposure list (50) with control instructions coordinates and controls the projectors (22) with regard to what shall be exposed, when it shall be exposed, where it shall be exposed  
15 and for how long it shall be exposed, and enables each projector (22) to be controlled, independently of the other projectors, to receive the same or different information in accordance with the exposure list (50) for exposure of respective projectors (22), **characterized** in that it comprises:

assigning means dividing the exposure list into a plurality of time slots of at least one  
20 specific length of time; and

organising means which as one preferred option facilitates said system to sort categories of the information in time slots to be displayed.

12. An arrangement according to claim 11, **characterized** in that it further comprises:

determining means determining how many times an information is to be exposed during a  
25 specific time period when booked;

category assigning means, whereby single spots or blocks of information are assigned a specific information-category;

priority assigning means for priority of exposure for an information;

computing means for decrement of priority a specific unit of priority for each exposure; and  
30 thus enabling that exposure interruption due to visual inaccessibility for information viewers is evened out during said specific time period for a single spot or block of information.

13. An arrangement according to claim 11 or 12, **characterized** in that each time slot is assigned a specific category of information by the assigning means.



14. An arrangement according to claim 11-13, **characterized** in that time slots in series booked with the same information sequence are assigned the same category of information by the organising means, whereby a time slot following the series is assigned a different category.

5 15. An arrangement according to claims 11-14, **characterized** in that information assigned a specific information-category is exposed through the system with at least one different information-category between themselves.

16. An arrangement according to claims 11-15, **characterized** in that said specific information category is given a specific code of placement in the exposure list (50) by said category assigning means.

10 17. An arrangement according to claims 11-16, **characterized** in that said priority is equal for every new information entry into the system.

18. An arrangement according to claims 11-17, **characterized** in that said priority decrements with the priority figure divided with all the entries of a specific information spot or block preferably truncated if the division is an infinite decimal figure through said computing  
15 means.

19. An arrangement according to claims 11-18, **characterized** in that said single information spot or block with the highest priority level is exposed, and that information spots or blocks which priority has reached a level of no priority left are not exposed by the system anymore.

20 20. An arrangement according to claims 11-19, **characterized** in that said information spots or blocks are exposed in series by the system if they have the same priority.

21. An arrangement according to claims 11-20, **characterized** in that said information spots or blocks having higher priority than zero or the like and the same information-category, a system choice information is exposed by the system between each information of the same  
25 category.

