

DISPLAY METHOD AND APPARATUS

CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims priority to Chinese Patent Application No. 201910239091.7, filed on March 27, 2019 and entitled “DISPLAY METHOD AND APPARATUS,” which is incorporated herein by reference in its entirety.

TECHNICAL FIELD

This application relates to the field of computer technologies, and in particular, to a display method and apparatus.

BACKGROUND

With the advent of the big data era, an increasingly large number of companies become aware of management and application of data resources, and display of big data on a visualization large screen becomes popular among more enterprises. According to existing large display screens, large screens in different styles are designed according to different requirements and cultures of different users. A large display screen generally needs to be customized in terms of typesetting, layout, and programming of the large screen by a professional user interface (UI) design team according to a requirement of an enterprise. However, instead of hiring professional design teams to design large screens, most enterprises usually make large screens by using design templates based on their industry. Such modular large display screens can hardly reflect personalized display requirements and user habits.

SUMMARY

In view of the foregoing problems, this application provides a display method and apparatus, and a main objective thereof is to provide a simple design solution for large-screen display for non-professional users, thereby improving the efficiency of large-screen design.

To achieve the foregoing objective, this application mainly provides the following technical solutions:

According to an aspect, this application provides a display method, including:
obtaining a design drawing including a plurality of display elements;
identifying attribute information of the display elements in the design drawing; and

generating a display diagram including standard display elements according to the attribute information.

According to another aspect, this application provides a display apparatus, including:

an obtaining unit, configured to obtain a design drawing including a plurality of display elements;

an identification unit, configured to identify attribute information of the display elements in the design drawing obtained by the obtaining unit; and

a generation unit, configured to generate a display diagram including standard display elements according to the attribute information obtained by the identification unit.

According to another aspect, this application provides an information display method, including:

obtaining an initial drawing including a plurality of display elements;

identifying attribute information of the display elements in the initial drawing; and

generating a display interface including standard display elements according to the attribute information.

According to another aspect, this application provides a storage medium configured to store a computer program, where the computer program, when executed, controls a device in which the storage medium is located to perform the display method of the embodiments of this application.

According to another aspect, this application provides an electronic device, where the electronic device includes a processor and a memory, and the processor is configured to invoke program instructions in the memory, to perform the display method of the embodiments of this application.

By means of the foregoing technical solutions, according to the display method and apparatus provided in this application, attribute information of display elements in a design drawing are identified to determine corresponding standard display elements, and a new display diagram is created based on these standard display elements, to implement automatic creation of the display diagram. In this way, the dependence of the display diagram on a graphic design skill is greatly reduced, for a common user to create a display diagram quickly according to a requirement of the user. When the solution is applied to a design of a visualization large screen, this application may identify a design drawing of a visualization large screen provided by a user by using a target detection model, and redo typesetting and layout according to the identification result for charts to be displayed in the visualization large screen, to obtain a display diagram of a visualization large screen that meets a requirement of the user. Compared

with an existing design manner of a visualization large screen, this application does not have a technical requirement on a design drawing provided by a user, and the design drawing may be a screenshot from a web page or may be a hand-sketch made by the user. Therefore, the design of a visualization large screen requires fewer professional skills of the user, more users mastering graphic design or professional users can freely demonstrate creativity and propose respective display requirements on large screens, for required visualization large screens to be automatically generated. In addition, the design efficiency of a display diagram of a visualization large screen is also improved.

The foregoing description is merely an overview of the technical solutions of this application. To understand the technical means of this application more clearly, implementation can be performed according to content of this specification. Moreover, to make the foregoing and other objectives, features, and advantages of this application more comprehensible, implementations of this application are particularly described below.

BRIEF DESCRIPTION OF THE DRAWINGS

Various other advantages and benefits become clear to a person of ordinary skill in the art by reading the following detailed description of exemplary implementations. The accompanying drawings are merely intended to show the preferred implementations and are not intended to constitute a limitation on this application. Throughout the accompanying drawings, the same reference numerals are used to represent the same components. In the accompanying drawings:

FIG. 1 is a flowchart of a display method, according to an embodiment of this application;

FIG. 2 is a hand-sketch drawing, according to an embodiment of this application;

FIG. 3 is a stock material screenshot drawing, according to an embodiment of this application;

FIG. 4 is a flowchart of another display method, according to an embodiment of this application;

FIG. 5 is a block diagram of components of a display apparatus, according to an embodiment of this application; and

FIG. 6 is a block diagram of components of another display apparatus, according to an embodiment of this application.

DETAILED DESCRIPTION

The following describes in detail exemplary embodiments of this application with reference to the accompanying drawings. Although the accompanying drawings show the exemplary embodiments of this application, it should be understood that this application may be implemented in various manners and is not limited by the embodiments described herein. Rather, these embodiments are provided, so that this application may be more thoroughly understood and the scope of this application may be completely conveyed to a person skilled in the art.

A display method according to an embodiment of this application is a technical solution that can help a user to generate a data display diagram quickly and conveniently. For the user, the user does not need to master professional skills, for example, graphic design skills such as typesetting and layout required for graphic design, and a required data display diagram can be correspondingly outputted provided that the user provides a design draft or a stock picture including required display elements. Step content is shown in FIG. 1 and includes the following steps.

Step 101: Obtaining a design drawing including a plurality of display elements.

The design drawing is an image inputted by a user according to a requirement of the user, and the image includes at least a plurality of display elements for displaying data. For example, as shown in FIG. 2, the design drawing may be a hand-sketch drawing by the user, or as shown in FIG. 3, the design drawing may be a large-screen stock drawing provided by the user. These design drawings are drawn by the user or obtained through searching on a web page according to service requirements of the user. As can be seen from the design drawings shown in FIG. 2 and FIG. 3, there are a plurality of charts in the drawings, for example, charts of different types and sizes such as a pie chart, a bar chart, and a line chart. In this application, the chart is one of the display elements. In addition, the display element may be alternatively a specific image identifier such as a portrait and a building. It should be noted that, the display elements in this application are graphic elements including a data display function.

In this application, a design drawing provided by the user is collected, display elements included in the design drawing are analyzed, and a new display diagram is created according to the structure of the design drawing. During specific implementation, the design drawing is not limited to being collected through an image collection device such as a camera, and the design drawing may be collected by a terminal (the user imports the design drawing into the terminal).

Step 102: Identifying attribute information of the display elements in the design drawing.

In this step, the display elements in the design drawing are identified based on an existing

image recognition technology, and the attribute information of the display elements, for example, attribute information such as types of the display elements and positions and sizes of the display elements in the design drawing, are determined.

Further, in the existing image recognition technology, an image is usually identified by using a trained model. In this step, a preferred solution for identifying the design drawing is to identify the attribute information of the display elements in the design drawing by using a target detection model trained based on a neural network. When the display elements are charts, the target detection model is mainly configured to detect from the design drawing charts including a plurality of pieces of display data and output attribute information of identified charts. The attribute information includes information such as types of the charts, relative positions and sizes of the charts in the design drawing, and colors used for the charts. In the embodiments of this application, an image recognition algorithm used by the target detection model is not limited, such as neural network-based image recognition, wavelet moment-based image recognition, and a fractal feature-based infrared image recognition method.

Through the execution of this step, the plurality of display elements included in the design drawing and parameter information such as the types, positions, and sizes of the display elements may be identified at the same time.

Step 103: Generating a display diagram including standard display elements according to the attribute information.

The attribute information in this step is information related to the display elements obtained by identifying the design drawing. To generate a data display diagram, corresponding standard display elements need to be added to a specified display diagram, to obtain a new data display diagram. The added standard display elements are not limited to standard display elements drawn and generated according to the attribute information, but may be standard display elements closest to the attribute information obtained through matching in a specified component library. During actual application, the time required for drawing a plurality of standard display elements is relatively long. Therefore, to reduce the response time for generating a display diagram, a method for presetting a component library and matching similar standard display elements from the component library is generally used.

It should be noted that, the size of the data display diagram may be preset, and as a result, the size and proportion of the design drawing may be different from those of the data display diagram, causing offsets in positions and sizes when the standard display elements are arranged in the display diagram. In view of this, in the embodiments of this application, the obtained attribute information may be converted and adjusted according to the size and proportion, to

ensure that structural proportions of the standard display elements in the display diagram and the display elements in the design drawing are similar; or typesetting and layout (including adjustment of the positions and the sizes) may be performed again according to the added charts and based on a display range provided by a current display diagram without making an adjustment, to make a chart layout in the display diagram more reasonable and aesthetic.

As can be seen from the foregoing embodiments, the display method provided in the embodiments of this application can automatically generate a new data display diagram according to the design drawing provided by the user. For the user, the embodiments of this application lower the bar for users to design a data display diagram, and enable users without professional graphic design knowledge to design desired data display diagrams conveniently. Therefore, this application can stimulate the creativity of the user in designing a data display diagram, and can directly convert a concept from a hand-sketch into a display diagram, for the data display diagram to be applicable to more application fields, and in particular, to a field of visualization large screens, thereby improving the application popularity of the visualization large screens.

Further, to improve the accuracy rate of the identification on the design drawing provided by the user, in a preferred embodiment of this application, a used target detection model is obtained through training by using a convolutional neural network. Therefore, before the steps shown in FIG. 1 are performed, samples used for training the target detection model need to be obtained first, the target detection model is then trained, and a specific process is as follows:

A display diagram sample carrying label information is first obtained.

The label information carried in the display diagram sample includes at least information such as types of the display elements and positions and sizes of the display elements in the display diagram. The position includes a position of an identifier coordinate point of a display element in the display diagram, such as a point in the upper-left corner of the display element, or a central point of the display element. The size includes an area of a region occupied by a display element in the display diagram, and size information of the display element is generally determined according to a length value and a height value of the display element.

In addition, in this embodiment, data display diagram samples are mainly classified into two types. One type is screenshot samples. This type of samples are screenshots captured from a page and are used for displaying data. As shown in FIG. 3, such type of samples mainly come from a large-screen stock material of a design website, a large-screen image in a movie screenshot, and the like. In such a sample, display elements in the image are labeled, to form label information, which mainly includes information such as types of the display elements,

positions, and sizes of the display elements in the display diagram, and colors of the display elements. That is, one screenshot sample includes at least a plurality of groups of label information of the display elements, which is used for labeling content of the display elements and a structural relationship between the display elements and the display diagram.

Another type is hand-sketch samples. As shown in FIG. 2, such type of samples are generally data display diagrams uploaded and drawn by different users manually. Such type of samples also carry label information such as corresponding types, positions, and sizes. Since a hand-sketch generally describes the types, positions, and sizes of charts on a large screen and specific colors are not limited, color information is generally not labeled in the hand-sketch sample.

The target detection model is then trained by using the display diagram sample.

In this embodiment, when the target detection model is trained, a Faster R-CNN network is preferably used to perform training. The Faster R-CNN is a target detection algorithm improved based on an R-CNN and a Fast R-CNN, and improves efficiency of determining a candidate box in an image by adding a neural network that extracts edges. That is, a region proposal network (RPN) is introduced into the Fast R-CNN to replace selective search, and anchor boxes are introduced to deal with change problems of a target shape (an anchor is a box of which a position and a size are fixed, and may be understood as a fixed proposal that is preset). Therefore, performing target detection by using the Faster R-CNN is a detection method with advantages such as high precision, a high speed, and a simple detection procedure in current mainstream target detection methods. A main principle and a detection procedure thereof are not described in detail herein.

Further, to generate a data display diagram that better meets a user requirement, when step 103 shown in FIG. 1 is performed, in a preferred embodiment of this application, local adjustment may be performed on the generated display diagram to achieve a better visual effect.

Standard display elements of corresponding types are obtained first according to the types of the display elements in the attribute information.

The standard display elements are display elements of specified types in a component library, and the component library is a display element set preset based on this application. The component library is provided with standard display elements of common types, and corresponding standard display elements may be obtained through matching according to the types of the identified display elements.

The standard display elements are arranged in a preset display screen according to the positions and sizes of the display elements in the design drawing in the attribute information,

to obtain the display diagram.

When arrangement is performed, a typesetting and layout operation is mainly performed on the plurality of standard display elements, to add the standard display elements to the display diagram of the preset display screen according to the identified positions and sizes.

During specific arrangement, when it is determined that the standard display elements in the preset display screen are displayed in an overlapping manner, the positions and sizes of the standard display elements are adjusted according to a preset strategy, to prevent the standard display elements from interfering with each other. The preset strategy may be set independently according to a specific application scenario or a specific industry. For example, positions of the charts may be adjusted first, and if the charts still overlap with each other, the sizes of the charts are then adjusted, or display proportions of the standard display elements that overlap with each other may be directly decreased according to a proportion of an overlapping part to the entire standard display elements, and a position adjustment operation such as alignment is then performed.

As can be seen, the display diagram obtained in this application is a new diagram formed by a plurality of standard display elements selected from a component library. Based on the display diagram, the user may add data to corresponding standard display elements to obtain a data diagram that needs to be displayed, and finally display the display diagram through the preset display screen.

Further, for the generated display diagram, since the standard display elements therein are generated based on the design drawing provided by the user, there may be a particular deviation in a display effect. Therefore, in another embodiment of this application, after the display diagram is generated, a manual adjustment operation may be further performed on arrangements of the standard display elements in the display diagram in combination with an adjustment instruction of the user. The adjustment operation includes, but is not limited to, modifying a type of a standard display element, addition or deletion of a standard display element, dragging of a position of a standard display element, and adjusting a size thereof. These adjustment operations of the user may be performed by receiving adjustment instructions of the user through an interaction interface.

Further, a main application scenario of the display method described in the foregoing embodiment is a visualization large screen, and data is displayed by using the visualization large screen. Correspondingly, the display elements in the foregoing embodiment are charts, which are a line chart, a bar chart, a pie chart, and the like shown in FIG. 3. In this scenario, the design drawing in the foregoing embodiment may be a design drawing of a visualization

large screen, and the drawing may be a hand-sketch, or may be a large-screen stock material screenshot. The standard display elements are standard charts in the preset component library. When the step of generating a display diagram including standard display elements according to the attribute information is performed, a specific implementation is as follows:

Corresponding standard charts are first extracted from the preset component library according to the attribute information of the charts.

The attribute information of the charts is attribute information of the charts obtained through identification in the design drawing, and corresponding standard charts are obtained through matching in the preset component library for the charts.

The display diagram is then generated based on configuration information of the visualization large screen and the standard charts.

The configuration information of the visualization large screen includes hardware configuration information and software configuration information of the visualization large screen. Information such as a size and a resolution of the display diagram may be determined based on the hardware configuration information. Information such as a data interface of the display diagram may be determined based on the software configuration information. The standard charts are laid out and arranged in the visualization large screen based on the configuration information of the visualization large screen, and a display diagram displayed in the visualization large screen is finally generated.

Based on the content of the foregoing embodiments, as shown in FIG. 4, this application provides a preferred embodiment of the display method applicable to a visualization large screen, and includes the following steps.

Step 201: Obtaining a visualization large screen display diagram sample carrying label information.

Step 202: Training a target detection model by using the visualization large screen display diagram sample.

Step 203: Obtaining a design drawing of the visualization large screen.

Step 204: Identifying the design drawing by using the target detection model, to obtain attribute information of a plurality of charts for displaying data in the visualization large screen.

Step 205: Obtaining standard charts of corresponding types from a preset component library according to types of the charts in the attribute information.

Step 206: Arranging the standard charts in the visualization large screen according to positions and sizes of the charts in the attribute information and configuration information of the visualization large screen, to obtain a display diagram of the visualization large screen.

Step 207: Performing an adjustment operation on the charts included in the display diagram according to a received adjustment instruction.

A display diagram of the visualization large screen that meets a user requirement is finally outputted after the adjustment.

Further, an embodiment of this application further provides an information display method. The method is used for visualization display of data information, and includes the following steps.

An initial drawing including a plurality of display elements is first obtained.

Attribute information of the display elements in the initial drawing is then identified.

A display interface including standard display elements is finally generated according to the attribute information.

In this embodiment of this application, the initial drawing may include the design drawing in the embodiment of FIG. 1, and the display interface may include the display diagram in the embodiment of FIG. 1. For specific step description and execution logic between the steps, reference may be made to the specific description of the embodiment shown in FIG. 1. Details are not described herein again.

In addition, further expanded description of the embodiment of FIG. 1 may be also correspondingly applicable to the information display method of this embodiment, and for details, reference may be made to the content of the foregoing description. Details are not described herein again.

Further, as implementations of the methods shown in FIG. 1 and FIG. 4, an embodiment of this application provides a display apparatus. The apparatus is mainly configured to identify a design drawing of a visualization large screen provided by a user, and reconstruct, according to an identification result, a display diagram of the visualization large screen required by the user, to simplify the design difficulty of the visualization large screen. For ease of reading, detailed content in the foregoing method embodiments is not described one by one in this apparatus embodiment. However, it should be clear that the apparatus in this embodiment can correspondingly implement all content in the foregoing method embodiments. As shown in FIG. 5, the apparatus includes:

an obtaining unit 31, configured to obtain a design drawing including a plurality of display elements;

an identification unit 32, configured to identify attribute information of the display elements in the design drawing obtained by the obtaining unit 31; and

a generation unit 33, configured to generate a display diagram including standard display

elements according to the attribute information obtained by the identification unit 32.

Further, the identification unit 32 is configured to identify the attribute information of the display elements in the design drawing by using a target detection model trained based on a neural network.

Further, as shown in FIG. 6, the apparatus further includes:

a sample collection unit 34, configured to obtain a display diagram sample carrying label information, where the label information includes at least types of the display elements and positions and sizes of the display elements in the display diagram; and

a model training unit 35, configured to train the target detection model by using the display diagram sample obtained by the sample collection unit 34.

Further, as shown in FIG. 6, the attribute information of the display elements includes at least types of the display elements and positions and sizes of the display elements in the design drawing, and the generation unit 33 includes:

an obtaining module 331, configured to obtain the standard display elements of corresponding types according to the types of the display elements; and

a generation module 332, configured to arrange, in a preset display screen according to the positions and the sizes of the display elements in the design drawing, the standard display elements obtained by the obtaining module 331, to obtain the display diagram.

Further, the generation module 332 is further configured to:

determine whether the standard display elements arranged in the preset display screen are displayed in an overlapping manner; and

if there are standard display elements displayed in the overlapping manner, decrease display proportions of the standard display elements that overlap with each other.

Further, as shown in FIG. 6, the apparatus further includes:

an adjustment unit 36, configured to perform, according to a received adjustment instruction, an adjustment operation on the standard display elements included in the display diagram obtained by the generation unit 33, where the adjustment operation includes at least one operation of modifying type, position, size, and color of the standard display elements.

Further, when the apparatus is a visualization large screen, the display elements are charts for displaying real-time data, and in the generation unit 33, the obtaining module 331 is further configured to extract corresponding standard charts from a preset component library according to attribute information of the charts; and

the generation module 332 is further configured to generate the display diagram based on configuration information of the visualization large screen and the standard charts.

Based on the above, according to the display method and apparatus provided in the embodiments of this application, the design drawing provided by the user is identified, to detect design information such as the types, positions, and sizes of the charts included in the design drawing, and select matching charts from the preset component library by using the design information, to construct a new display diagram of a visualization large screen. In this way, the user can design a required large-screen display diagram more conveniently. In addition, to inspire more unconstrained creativity of the user, this application receives an adjustment instruction of the user for a single chart in the large-screen display diagram through an interaction interface, to make the large-screen display diagram more aesthetic and better meet a user requirement.

Further, an embodiment of this application further provides a processor. The processor is configured to run a program. The processor, when executed, causes the processor to perform the display method according to the embodiment of FIG. 1 or FIG. 4.

In addition, an embodiment of this application further provides an electronic device. The electronic device includes a processor and a memory. The memory is configured to store a program. The processor is coupled to the memory to run the processor, to perform the display method according to the embodiment of FIG. 1 or FIG. 4.

In the foregoing embodiments, description of each embodiment focuses on a different part, and for parts that are not described in detail in one embodiment, reference may be made to the related description of other embodiments.

It may be understood that for related features in the foregoing method and apparatus, reference may be made to each other. In addition, the terms such as “first” and “second” in the foregoing embodiments are used to distinguish the embodiments, and do not imply the preference among the embodiments.

A person skilled in the art can clearly understand that for convenience and conciseness of description, for specific working processes of the foregoing systems, devices, and units, reference may be made to the corresponding processes in the foregoing method embodiments, and details are not described herein again.

The algorithms and displays provided herein are not inherently related to any particular computer, virtual system, or other devices. Various general purpose systems can also be used together with teaching set forth herein. From the above description, the structure required to construct such a system is evidently clear. In addition, this application is not directed to any particular programming language. It should be understood that the content of this application described herein may be implemented by using various programming languages and the above

description of a particular language is to disclose an optimal implementation of this application.

In addition, the memory may include the following forms of computer-readable media: a non-persistent memory, a random access memory (RAM), and/or a non-volatile memory, or the like, for example, a read-only memory (ROM) or a flash memory (flash RAM), and the memory includes at least one storage chip.

A person skilled in the art can understand that the embodiments of this application may be provided as a method, a system, or a computer program product. Therefore, this application may use a form of hardware-only embodiments, software-only embodiments, or embodiments combining software and hardware. Moreover, this application may use a form of a computer program product that is implemented on one or more computer-usable storage media (including but not limited to a disk memory, a CD-ROM, an optical memory, and the like) that include computer-usable program code.

This application is described with reference to flowcharts and/or block diagrams of the method, the device (system), and the computer program product according to the embodiments of this application. It should be understood that computer program instructions may be used to implement each process and/or each block in the flowcharts and/or the block diagrams and a combination of a process and/or a block in the flowcharts and/or the block diagrams. These computer program instructions may be provided to a general-purpose computer, a dedicated computer, an embedded processor, or a processor of another programmable data processing apparatus to generate a machine, so that the instructions executed by the computer or the processor of the programmable data processing apparatus generate an apparatus for implementing a specific function in one or more processes in the flowcharts and/or in one or more blocks in the block diagrams.

These computer program instructions may also be stored in a computer-readable memory that can instruct a computer or any other programmable data processing device to work in a specific manner, so that the instructions stored in the computer readable memory generate an artifact that includes an instruction apparatus. The instruction apparatus implements a specific function in one or more processes in the flowcharts and/or in one or more blocks in the block diagrams.

These computer program instructions may also be loaded onto a computer or another programmable data processing device, so that a series of operations and steps are performed on the computer or the programmable device, thereby generating computer-implemented processing. Therefore, the instructions executed on the computer or the programmable device provide steps for implementing a specific function in one or more processes in the flowcharts

and/or in one or more blocks in the block diagrams.

In a typical configuration, the computer device includes one or more processors (CPUs), an input/output interface, a network interface, and a memory.

The memory may include the following forms of computer-readable media: a non-persistent memory, a RAM, and/or a non-volatile memory, or the like, for example, a ROM or a flash RAM. The memory is an example of the computer-readable medium.

The computer-readable medium includes a non-volatile medium and a volatile medium, a removable medium and a non-removable medium, which may implement storage of information by using any method or technology. The information may be a computer-readable instruction, a data structure, a program module, or other data. Examples of a computer storage medium include but are not limited to a phase-change memory (PRAM), a static random access memory (SRAM), a dynamic random access memory (DRAM), another type of random access memory (RAM), a read-only memory (ROM), an electrically erasable programmable read-only memory (EEPROM), a flash memory or other memory technology, a compact disc read-only memory (CD-ROM), a digital versatile disc (DVD) or other optical storage, a cassette tape, a magnetic tape, a magnetic disk storage, or another magnetic storage device, or any other non-transmission medium, which may be configured to store information accessible by a computing device. Based on the definition in this application, the computer-readable medium does not include transitory computer-readable media (transitory media), such as a modulated data signal and a carrier.

It should be further noted that the terms “include,” “comprise,” or any variants thereof are intended to cover a non-exclusive inclusion. Therefore, a process, method, article, or device that includes a series of elements not only includes such elements, but also includes other elements not specified expressly, or may include inherent elements of the process, method, article, or device. Without further limitation, the element defined by the phrase “include one” does not exclude other same elements in the process, method, article, or device which includes the element.

A person skilled in the art should understand that the embodiments of this application may be provided as a method, a system, or a computer program product. Therefore, this application may use a form of hardware-only embodiments, software-only embodiments, or embodiments with a combination of software and hardware. Moreover, this application may use a form of a computer program product that is implemented on one or more computer-usable storage media (including but not limited to a disk memory, a CD-ROM, an optical memory, and the like) that include computer-usable program code.

The foregoing descriptions are merely embodiments of this application, and are not intended to limit this application. For a person skilled in the art, various modifications and variations can be made to this application. Any modification, equivalent replacement, or improvement made without departing from the spirit and principle of this application shall fall within the scope of the claims of this application.

CLAIMS

What is claimed is:

1. A display method, comprising:
obtaining a design drawing comprising a plurality of display elements;
identifying attribute information of the display elements in the design drawing; and
generating a display diagram comprising standard display elements according to the attribute information.
2. The method according to claim 1, wherein the identifying attribute information of the display elements in the design drawing comprises:
identifying the attribute information of the display elements in the design drawing by using a target detection model trained based on a neural network.
3. The method according to claim 2, wherein the method further comprises:
obtaining a display diagram sample carrying label information, wherein the label information comprises at least types of the display elements and positions and sizes of the display elements in the display diagram; and
training the target detection model by using the display diagram sample.
4. The method according to claim 1, wherein the attribute information of the display elements comprises at least types of the display elements and positions and sizes of the display elements in the design drawing, and the generating a display diagram comprising standard display elements according to the attribute information comprises:
obtaining the standard display elements of corresponding types according to the types of the display elements; and
arranging the standard display elements in a preset display screen according to the positions and the sizes of the display elements in the design drawing, to obtain the display diagram.
5. The method according to claim 4, wherein the arranging the standard display elements in a preset display screen according to the positions and the sizes of the display elements in the design drawing comprises:
determining whether the standard display elements arranged in the preset display screen are displayed in an overlapping manner; and
if there are standard display elements displayed in the overlapping manner, decreasing display proportions of the standard display elements that overlap with each other.
6. The method according to claim 3, wherein the display diagram sample comprises a screenshot sample and a hand-sketch sample, and label information in the screenshot sample further comprises screenshot color information and display element color information.
7. The method according to claim 1, wherein the method further comprises:
performing an adjustment operation on the standard display elements included in the display diagram according to a received adjustment instruction, wherein the adjustment operation comprises at least one operation of modifying type, position, size, and color of the standard display elements.
8. The method according to any of claims 1 to 7, wherein when the method is applied to a visualization large screen, the display elements are charts for displaying data; and
the generating a display diagram comprising standard display elements according to the attribute information comprises:
extracting corresponding standard charts from a preset component library according to attribute information of the charts; and
generating the display diagram based on configuration information of the visualization large screen and the standard charts.

9. A display apparatus, comprising:
an obtaining unit, configured to obtain a design drawing comprising a plurality of display elements;
an identification unit, configured to identify attribute information of the display elements in the design drawing obtained by the obtaining unit; and
a generation unit, configured to generate a display diagram comprising standard display elements according to the attribute information obtained by the identification unit.
10. The apparatus according to claim 9, wherein the identification unit is configured to identify the attribute information of the display elements in the design drawing by using a target detection model trained based on a neural network.
11. The apparatus according to claim 10, wherein the apparatus further comprises:
a sample collection unit, configured to obtain a display diagram sample carrying label information, wherein the label information comprises at least types of the display elements and positions and sizes of the display elements in the display diagram; and
a model training unit, configured to train the target detection model by using the display diagram sample obtained by the sample collection unit.
12. The apparatus according to claim 9, wherein the attribute information of the display elements comprises at least types of the display elements and positions and sizes of the display elements in the design drawing, and the generation unit comprises:
an obtaining module, configured to obtain the standard display elements of corresponding types according to the types of the display elements; and
a generation module, configured to arrange, in a preset display screen according to the positions and the sizes of the display elements in the design drawing, the standard display elements obtained by the obtaining module, to obtain the display diagram.
13. The apparatus according to claim 12, wherein the generation module is further configured to:
determine whether the standard display elements arranged in the preset display screen are displayed in an overlapping manner; and
if there are standard display elements displayed in the overlapping manner, decrease display proportions of the standard display elements that overlap with each other.
14. The apparatus according to claim 9, wherein the apparatus further comprises:
an adjustment unit, configured to perform, according to a received adjustment instruction, an adjustment operation on the standard display elements included in the display diagram obtained by the generation unit, wherein the adjustment operation comprises at least one operation of modifying type, position, size, and color of the standard display elements.
15. The apparatus according to any one of claims 9 to 14, wherein when the apparatus is applied to a visualization large screen, the display elements are charts for displaying data; and the generation unit further includes:
the obtaining module configured to extract corresponding standard charts from a preset component library according to attribute information of the charts; and
the generation module configured to generate the display diagram based on configuration information of the visualization large screen and the standard charts.
16. An information display method, comprising:
obtaining an initial drawing comprising a plurality of display elements;
identifying attribute information of the display elements in the initial drawing; and
generating a display interface comprising standard display elements according to the attribute information.
17. A storage medium configured to store a computer program, wherein the computer program, when executed, controls a device in which the storage medium is located to perform the display method according to any one of claims 1 to 8.

18. An electronic device, wherein the electronic device comprises a processor and a memory, and the processor is configured to invoke program instructions in the memory, to perform the display method according to any one of claims 1 to 8.