IPOS

INTELLECTUAL PROPERTY
OFFICE OF SINGAPORE

REGISTERED DESIGNS

A GUIDE ON NON-PHYSICAL PRODUCTS

IDEAS TODAY,
ASSETS TOMORROW.

Introduction

Virtual designs which are produced by immersive technologies such as augmented reality, virtual reality, and mixed reality are gaining commercial popularity. Some forms of virtual designs are applied to articles and these can be protected as regular designs under the registered designs regime in Singapore.

In 2017, Singapore expanded the registered designs protection to include another form of virtual design that is applied to a non-physical product.

IPOS hopes that the publication of such guidelines will better assist applicants in seeking design protection for their designs in Singapore.

The guidelines published here are not exhaustive and are meant for informational purposes only. As virtual designs technologies evolve and change the way in which businesses seek IP protection, this document will be updated in the form of future editions. We welcome feedback and comments as we continue to update and improve our guidelines.

REVISION HISTORY

Version	Description of Revisions	Chapter	Date of Release
Nov 2020	First Version	-	17 Nov 2020
Dec 2021	Update of IPOS logo	-	27 Dec 2021
Jun 2022	Replace "IP^{2}SG" with "IPOS Digital Hub"	-	2 Jun 2022

CONTENTS

1. UNDERSTANDING VIRTUAL DESIGNS & EXTENDED REALITY (XR)

Virtual Designs & Extended Reality (XR)

1.1   Virtual designs refer to designs that do not have a physical form and are generally produced by immersive technologies. Extended Reality (XR) is an umbrella term for immersive technologies created by computer technologies and wearables. It encompasses all forms of real-and-virtual combined environments and human machine interactions, including Augmented Reality (AR), Virtual Reality (VR), and Mixed Reality (MR).

Reality-Virtuality Continuum

1.2   In the reality-virtuality continuum introduced by Paul Milgram, it illustrates a continuous scale ranging between the real-world environment and the completely digitally-created environment. This continuum therefore also encompasses all forms of immersive technologies mentioned above.

1.3   These technologies may contain designs applied to articles or non-physical products. Hence, not all forms of immersive technologies are considered as non-physical products. More details with examples can be found on page 16.

Augmented Reality (AR)

1.4   Augmented reality (AR) adds graphics, sounds, haptic feedback to real-world environments by overlaying computer-generated content into the user's view of the real world. It alters one's perception of a real-world environment. AR can be experienced through portable devices, smart glasses and AR headsets. An example of AR is a game character superimposed onto the real-world environment, which the user views from the screen of a

mobile device. Another example of AR is the projection of a virtual keyboard on the surface of a table.

The Reality-Virtuality Continuum

Reality *The real world environment*	**Augmented Reality** *Virtual content augmented onto the real world environment*	**Augmented Virtuality** *Real content augmented onto a virtual environment*	**Virtual Reality** *Completely digitally created environment*

Mixed Reality
Any experience between the two extremes of the continuum
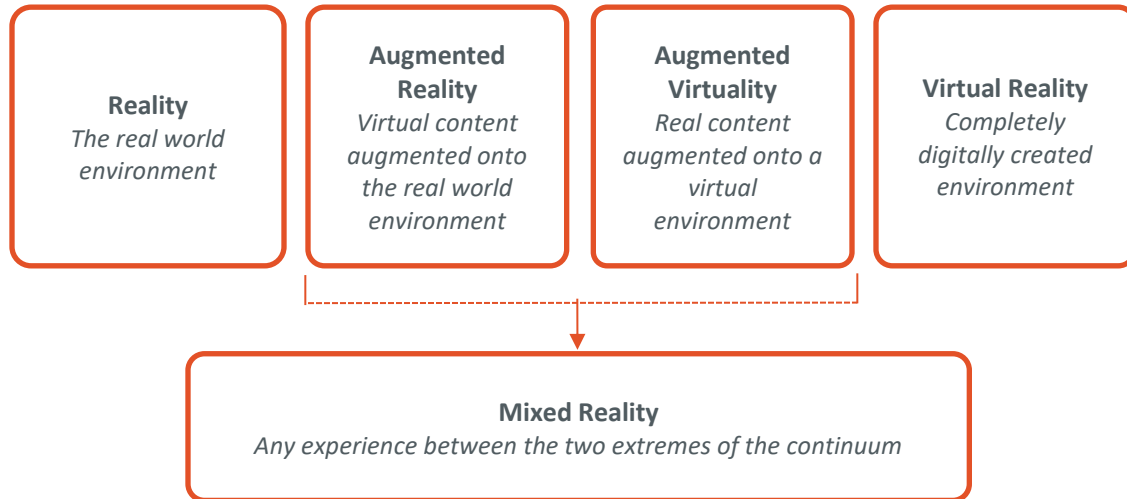
Augmented Virtuality (AV)

1.5   Augmented virtuality (AV) overlays real world objects and content into the user's view of the virtual world. It alters one's perception of a virtual-world environment. AV is typically experienced through a headset where the user is immersed in a virtual environment. An example of AV is a user wearing a virtual headset, seeing and eating real-world food products in a simulated virtual-world environment.

Mixed Reality (MR)

1.6   Mixed reality (MR) seamlessly blends the user's real-world environment and digitally-created content to bring a totally new experience. It includes the experience of both AR and AV where users are able to interact with the digitally-created content in the real-world surroundings.

1.7   In the AR context, the user sees the real world and anchors virtual objects to a point in real space, making them appear as real objects from the perspective of the MR user. Another form of MR, in the AV context, enables the user to see and interact with the real-world objects in a completely virtual environment. These two forms of MR are typically experienced through holographic devices and immersive devices. An example of MR is a

surgeon viewing a virtual overlay of the patient's data and live information through a head mounted see-through glasses while performing an operation.

Virtual Reality (VR)

1.8   Virtual reality (VR) provides a completely immersive experience that shuts the users out of the real-world environment. It uses reality headsets to generate realistic sounds, images and other sensations that mimic a real environment or create an imaginary world. It makes the users believe and perceive it as the real environment. The users are able to explore and interact with the computer-generated environment.

1.9   There are two main types of VR headsets, namely PC-connected headsets and standalone headsets. PC-connected headsets are connected to a computer or a gaming console to generate high-quality virtual experiences. Most standalone headsets use a smartphone screen to provide a more affordable VR experience. Other standalone headsets work on their own and do not require a computer or headset to generate VR experiences. An example of VR is a user playing a video game in a virtual environment viewed from a headset.

2. UNDERSTANDING THE REQUIREMENTS FOR REGISTRATION OF NON-PHYSICAL PRODUCTS

Design

means features of shape, configuration, colours, pattern or ornament applied to any **article** or **non-physical product** that give that article or non-physical product its appearance.

Section 2 of Registered Designs Act (RDA)

Article

means any thing that is manufactured (whether by an industrial process, by hand or otherwise), and includes —

(a) any part of an article, if that part is made and sold
separately; and

(b) any set of articles.

Non-Physical Product

(a) means any thing that —
(i) does not have a physical form;

(ii) is produced by the projection of a design on a surface or into a medium (including air); and

(iii) has an intrinsic utilitarian function that is not merely to portray the appearance of the thing or to convey information; and

(b) includes any set of non-physical products.

Regular Design

Form of Virtual Design

Criterion 1: Does Not Have a Physical Form

2.1   The design should not be tangible or have a physical form.

Criterion 2: Produced by the Projection of a Design on a Surface or into a Medium (Including Air)

2.2   To fulfil the criterion of being produced by the projection on a surface or into a medium (including air), the design should be projected from a light source. A virtual keyboard or number pad that is projected on a surface would fulfil this criterion.

2.3   If the design is merely emitted from a device with no production of the design on a surface or into a medium (including air), it would not fulfil this criterion. For example, graphical user interface (GUI) applied on a display screen of a mobile phone is considered as a design emitted from a mobile phone. Such design is not considered to have been applied to a non-physical product. It is considered as GUI applied to an article (e.g. electronic device) instead. Refer to **Practice Direction on GUI** for more information on registration of GUI.

Criterion 3: Intrinsic Utilitarian Function that is Not Merely to Portray the Appearance of the Thing or to Convey Information

2.4   The non-physical product must perform a utilitarian function, and this is in line with the central policy underlying the registered designs regime i.e. registered designs are intended to protect things which have utilitarian functions and to avoid overlap with copyright protection.

2.5   Having regard to the interface between copyright and registered designs, the definition of "non-physical product" was aligned with the definition of "useful article" in section 70(4) of the Copyright Act to include the requirement of having an "intrinsic utilitarian function that is not merely to portray the appearance of the thing or to convey information".

2.6   A virtual keyboard that is projected onto a surface and allows the user to type characters, in the same manner as a physical computer keyboard, is an example of a non-physical product. Its intrinsic utilitarian function would be that it can be used to type characters in the same manner as a physical computer keyboard.

2.7   Projected designs which are merely for decorative purposes and do not serve any useful function would not be registrable e.g. the virtual projection of a vase of flowers. In addition, projected designs which are merely used to convey information are not registrable.

3. EXAMPLES OF POTENTIALLY REGISTRABLE NON-PHYSICAL PRODUCTS

A. Designs of Musical Instruments Produced via A Smart Projector

Function
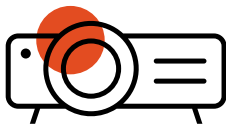
3.1 The smart projector can convert any flat surface into an interactive screen using a combination of infrared technology and real-time detection via built-in camera(s). Users are able to directly interact with the projections like how it would be done with a physical product. Examples include the designs of pianos or turntables which users are able to interact with (as if the projection were an actual physical product). In the case of the virtual piano, notes of different pitches are produced as the user plays the different keys. For the virtual turntable, the music and sound effects will sync to the hand movements of the user or deejay.

Considerations

3.2 The potential non-physical products are the musical instruments e.g. design of a piano or turntable projected on a surface.

3.3 The projected musical instruments do not have a physical form and can be projected on any surface (Fulfils Criteria 1 & 2). The user is able to directly control and interact with the projected musical instruments to perform the musical functions e.g. touching the projected piano keys will generate musical notes (Fulfils Criterion 3).

✓ 1. Does not have a physical form

✓ 2. Is produced by the projection of a design on a surface or into a medium (including air)

✓ 3. Has an intrinsic utilitarian function that is not merely to portray the appearance of the thing or to convey information

(Legend: ✓ - Fulfil Criterion, ✗ – Does not fulfil Criterion)

B. Designs of a Whiteboard Produced via a Smart Projector
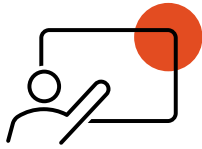
Function

3.4 The whiteboard can be projected onto any surface by the projector and users are able to control their presentations and write on the virtual whiteboard by using interactive virtual pens. Such a whiteboard may also support the sharing and printing of the written information. Any image or writing on the whiteboard can be resized and moved as if it were an object.

Considerations

3.5 The potential non-physical product is the projected whiteboard which consists of icons, diagrams or other designs added by the user.

3.6 The projected whiteboard does not have a physical form and can be projected onto any surface (Fulfils Criteria 1 & 2). The user is able to write and use the whiteboard as if it were an actual physical whiteboard. Moreover, the user can also interact with the whiteboard by pressing on the projected icons which allow editing, importing, emailing or printing of information written on the virtual whiteboard (Fulfils Criterion 3).

✔ 1. Does not have a physical form

✔ 2. Is produced by the projection of a design on a surface or into a medium (including air)

✔ 3. Has an intrinsic utilitarian function that is not merely to portray the appearance of the thing or to convey information

(Legend: ✔ - Fulfil Criterion, ✘ – Does not fulfil Criterion)

C.   Designs of Virtual Characters Used in Concerts

Function

3.7   There has been an increasing use of projected virtual characters in concerts that interact with the performer(s) on stage and even with the audience, giving these characters their own distinct identifications as if they were actual performers. In some instances, these virtual characters are able to "interact" and portray different appearances due to the motion capture suits worn by the accompanying human performer(s) or offstage actors.

Considerations

3.8   The projected characters do not have a physical form and can be projected onto any surface (Fulfils Criteria 1 & 2). The function of the projected characters is to portray the appearance of performers who are able to dance. Any interaction of the projected characters with the accompanying performers or offstage actors merely allows the appearance of the characters to change. For example, the projected characters may wave their hands due to interaction with the performers. Hence, the projected characters have no other function besides portraying the appearance as performers (Does not fulfil Criterion 3).

> ✓ 1. Does not have a physical form
>
> ✓ 2. Is produced by the projection of a design on a surface or into a medium (including air)
>
> ✗ 3. Has an intrinsic utilitarian function that is not merely to portray the appearance of the thing or to convey information
>
> **(Legend: ✓ - Fulfil Criterion, ✗ – Does not fulfil Criterion)**

D.   Designs Produced via Head-Up Display

Function

3.9   A head-up display shows information without requiring users to look away from their usual viewpoints. An application of this is in a vehicle where the display is directly in the line of the driver's sight to provide information such as speed, warning signals and indicator arrows for navigation. It eliminates the need for the driver to look down to the instrument cluster or the secondary display. In most instances, the virtual image is projected onto the windscreen of the car.

Considerations

3.10   The potential non-physical product is the virtual speedometer, warning signal or indicator arrow displayed on the windscreen (Fulfils Criterion 1). The information or image displayed is projected onto the windscreen (Fulfils Criterion 2). The virtual speedometer, warning signal or indicator arrow is meant to convey information to the user about the status of the car e.g. speed or distance. Any interaction with the user merely allows the alteration of the information that is displayed e.g. distance or speed in km/h or miles/h. Hence, it has no other function besides conveying information about the status of the car (Does not fulfil Criterion 3).

> ✓ 1. Does not have a physical form
>
> ✓ 2. Is produced by the projection of a design on a surface or into a medium (including air)
>
> ✘ 3. Has an intrinsic utilitarian function that is not merely to portray the appearance of the thing or to <u>convey information</u>
>
> **(Legend: ✓ - Fulfil Criterion, ✘ – Does not fulfil Criterion)**

E.   Designs of AR Games Displayed on Mobile Phone

Function

3.11   Augmented reality games integrate the games' visual and audio content with the user's environment. It superimposes a pre-created environment on top of the actual environment. An example is the use of a smart phone's camera to capture the user's real-world environment and display the AR games (designs) on the electronic device screen.

Considerations

3.12   The virtual characters or objects used in the AR games do not have a physical form as they are displayed on the screen (Fulfils Criterion 1). The AR designs used in the mobile phone games and applications are merely displayed or emitted from the screen of the devices and are not produced by the projection on a surface or into a medium (Does not fulfil Criterion 2). The function of the AR designs is to merely portray the appearance for the user to play and enjoy the game (Does not fulfil Criterion 3).

> ✓ 1. Does not have a physical form
>
> ✖ 2. Is produced by the projection of a design on a surface or into a medium (including air)
>
> ✖ 3. Has an intrinsic utilitarian function that is not merely to portray the appearance of the thing or to convey information
>
> **(Legend: ✓ - Fulfil Criterion, ✖ – Does not fulfil Criterion)**

3.13   These designs are not considered as non-physical products, but rather graphical user interfaces applied onto electronic devices. Such game designs and interfaces can be registered as graphical user interfaces (GUI) applied to articles instead. Refer to **Practice Direction on GUI** for more information on registration of GUI.

F.   Designs from a Virtual Reality Headset

Function

3.14   The virtual reality headset is a head-mounted device that provides a virtual reality experience for the user through a wide field of vision and 360-degree immersion. The user is able to view a completely virtual environment by shutting himself out of the physical world for a completely immersive experience.

Considerations

3.15   The virtual environment or designs that appear on the screen of the virtual reality headset do not have a physical form (Fulfils Criterion 1). The virtual environment or designs are merely displayed or emitted from the screen of the virtual reality headset and are not produced by the projection on a surface or into a medium (Does not fulfil Criterion 2). The function of the designs displayed on the screen is to merely portray their appearance to the user (Does not fulfil Criterion 3).

> ✓ 1. Does not have a physical form
>
> ✘ 2. Is produced by the projection of a design on a surface or into a medium (including air)
>
> ✘ 3. Has an intrinsic utilitarian function that is not merely to portray the appearance of the thing or to convey information
>
> **(Legend: ✓ - Fulfil Criterion, ✘ – Does not fulfil Criterion)**

3.16   Such designs may be considered as graphical user interfaces applied onto a display screen instead of non-physical products and may be registered as graphical user interface (GUI) applied to an article. Refer to **Practice Direction on GUI** for more information on registration of GUI.

Summary of Reality-Virtuality Continuum & Designs Protection

	Reality	Augmented Reality (AR)		Augmented Virtuality (AV)	Virtual Reality (VR)
Description	Real-World Environment	Virtual content overlaid onto the real-world environment		Real-world content overlaid onto a virtual environment	Completely digitally-created virtual environment
Environment	Real-World	Real-World		Virtual	Virtual
Example(s)	Keyboard	Images of game characters superimposed onto real-world streets or buildings, which the user sees from the electronic device e.g. mobile phone. (Example E)	Laser virtual keyboard, which is a form of computer input device whereby the image of a virtual keyboard is projected on a surface. When the user touches the surface covered by an image of a key, the device records the corresponding keystroke and provides an output of that key on the screen of an electronic device. (Example A)	Augmented reality contextual research which allows users to try real-world products (such as food) in a simulated virtual environment, generally for market research purposes. The virtual environment is generally viewed via a virtual headset. (AV Example on page 6)	Images of virtual game characters and environment viewed from a virtual headset which allows the user to play video games in a virtual environment. (Example F)

	Reality	Augmented Reality (AR)		Augmented Virtuality (AV)	Virtual Reality (VR)
Nature of content	The keyboard is a real-world article.	The images of the game characters are virtual.	The virtual keyboard is created by projection of images on a surface.	The food and virtual headset are real-world articles. The environment which the user views from the virtual headset is virtual.	The images of the game characters and environment are virtual.
Is it considered as an article?	The keyboard is an article.	The electronic device e.g. mobile phone is an article.	No	The food and headset are articles.	The headset is an article.
Is it considered as a non-physical product?	No	No	Yes	No	No
Protection under Registered Designs Act	The design of the keyboard may be protected as an article.[1]	The design of the game characters may be protected as a graphical user interface applied onto an electronic device (Article).	The design of the virtual keyboard may be protected as a non-physical product.[1]	The design of the virtual environment may be protected as a graphical user interface applied onto an electronic device (Article).	The design of the game character and/or virtual environment may be protected as a graphical user interface applied onto an electronic device (Article).

[1] If the design of the physical keyboard and virtual keyboard is the same, it can be registered as a design applied to both an article and non-physical product in one application.

4. KEY APPLICATION REQUIREMENTS

General

4.1 The general requirements for designs registration can be found in our Designs Infopack and **the IPOS Digital Hub Practice Direction**. This section highlights the application requirements that are specific to non-physical products

Name and Classification of Non-Physical Product

4.2 As the non-physical product needs to fulfil the criterion of having an intrinsic utilitarian function that is not merely to portray the appearance of the thing or to convey information, the name of the non-physical product would follow that as if the product is 'physical'. In this case of the virtual keyboard, the name of the non-physical product could be "Keyboard".

4.3 It is possible for the same design to be applied to an article as well as to a non-physical product. If the representations (i.e. images) of the design applied to the article and non-physical product are the same, it can be filed in a single application. In such a situation, the design applicant will have to indicate the name of the article and the name of the non-physical product, which both would be "Keyboard".

4.4 All design applications must be classified according to the **Practice Direction on Classification** issued by the Registrar (rule 26 of Registered Designs Rules). The list of classification is adopted from the Locarno Classification, with the exception of class 32. A design can be filed and classified under more than one class or sub-class. For example, a non-physical computer keyboard may be filed under class 14-02.

Operation/ Function of Non-Physical Product

4.5   The applicant is encouraged to submit a cover letter to explain how the non-physical product functions for the Registrar to determine whether it meets the requirements of a non-physical product. If such an explanation is not provided at the point of filing, the Registrar may issue a clarification letter to request the applicant to provide it.

Representations of Design

4.6   The design should be capable of being represented clearly and without subjectivity on the application for design registration and retain the same (or substantially similar) design features irrespective of the surface or medium they are projected on.

4.7   The representation of the design accompanying the application form should show the design applied to the non-physical product. The design should show the keyboard as projected on a surface or into the air. The design should not show the device for projecting the non-physical product.

4.8   If the design is dynamic and can change to different states of operation, it should be shown in a series of static representations, where each representation (in the form of a drawing or photograph) shows a freeze-frame of the design in action.

4.9   Please refer to **the IPOS Digital Hub Practice Direction** on the size and mode of representations when submitting an electronic form.

5. RIGHTS CONFERRED BY REGISTRATION OF NON-PHYSICAL PRODUCTS

Exclusive Rights

5.1   The registration of a design for non-physical product gives the registered owner the following exclusive rights –

a. To make in Singapore, or import into Singapore, for sale or hire or for use for the purpose of trade or business	b. To sell, hire, or offer or expose for sale or hire, in Singapore
Any device for projecting a non-physical product (being a non-physical product in respect of which the design is registered, and to which that design or a design not substantially different from it has been applied).	Any non-physical product in respect of which the design is registered, and to which the design or a design not substantially different from it has been applied. Any device for projecting a non-physical product.

Infringement

5.2   No proceedings shall be taken for an infringement of a registered design committed before the date on which the certificate of registration of the design is issued under section 18 of RDA.

5.3   The right in a registered design is not infringed by the doing of any act for a private non-commercial purpose, evaluation, analysis, research or teaching in accordance to section 30(5) of RDA.

5.4   A computer program/source code that can be installed on a device to project a non-physical product is also capable of copyright protection – computer programs and source codes are literary works under the Copyright Act. If a third party makes available such a program or source code on a website without the copyright owner's consent, the registered proprietor of the design (insofar as he is also the copyright owner) can sue for copyright infringement.

Infringement Proceedings

Relief

5.5   The relief which the Court may grant in infringement proceedings includes —
   a.   an injunction (subject to such terms, if any, as the Court thinks fit); and
   b.   either damages or an account of profits.

Infringing Device

5.6   An infringing device in relation to a registered design is a device for projecting a non-physical product where —

   a.   the design, or a design not substantially different from that design, has been applied to the non-physical product; and
   b.   either or both of the following apply:
      i.   the device is made in Singapore or imported into Singapore in such a way as to infringe the design;
      ii.   the device is sold, let for hire, or offered or exposed for sale or hire in Singapore in such a way as to infringe the design.

Order for Delivery Up

5.7   Where the defendant to proceedings for infringement of a registered design has in his possession —

   a.   any infringing article in relation to that design;
   b.   anything predominantly used for the making of infringing articles, which the defendant knows or has reason to believe has been or is to be used to make infringing articles; or
   c.   any infringing device in relation to that design,

   the Court may, in addition to any relief granted under section 36, order the article, thing or infringing device to be delivered to the plaintiff.

Order for Disposal

5.8   Where any infringing article or thing, or any infringing device, has been delivered up, an application may be made to the Court —

      a.   for an order that it be destroyed or forfeited to such person as the Court thinks fit; or

      b.   for a decision that no such order should be made.

5.9   In deciding what order, if any, should be made, the Court shall have regard to —

      a.   whether other remedies available in proceedings for infringement would be adequate to compensate the plaintiff and protect his interest; and

      b.   the need to ensure that no infringing article or thing, and no infringing device, is disposed of in a manner that would adversely affect the plaintiff.

6. QUICK QUESTIONS & ANSWERS

Application Procedure

6.1   **Question A:** I intend to register my new design which can be applied to both an article as well as a non-physical product. Do I have to file a single application or two separate applications i.e. one for the design applied to the article and another for the non-physical product?

   Question B: I have developed a design which can be displayed as a graphical user interface on a virtual headset (i.e. article), and also projected as a non-physical product on any surface (e.g. surface of table or wall). Do I have to file a single application or two separate applications i.e. one for the graphical user interface and another for the non-physical product?

   Answer to Questions A and B: If the representations (i.e. images) of the design applied to the article and non-physical product are the same, it can be filed in a single application. You should enter both the fields "Article name" and "Non-physical product name" in Form D3. Otherwise, they can be filed as 2 separate applications.

Subsequent Registration

6.2   **Question:** I have previously registered my design which is applied to an article. I would now like to obtain protection for the same design which is applied to a non-physical product. Can I do so?

   Answer: Yes, you may apply for the registration of the same design which is now applied to a non-physical product or even a different article. You should associate the new application to the previous registration of the same design which is applied to an article. You should enter the application number under the "Associated design" field in Form D3. If this new application is registered, the expiry of the period of registration (15 years) will follow that of the previous registration.

Novelty

6.3 **Question:** I have developed a non-physical keyboard which is the same as an existing design of a physical keyboard that belongs to another designer. Can I apply for design registration of this non-physical keyboard?

Answer: If the non-physical keyboard is the same as a physical keyboard that has been registered, or published in Singapore or elsewhere, it shall not be regarded as new. Hence, it cannot be registered as a design in Singapore. In order to be regarded as new, the non-physical product should not be the same, or differ from the registered or published design only in immaterial details or in features which are variants commonly used in the trade.

Rights Conferred by Registration

6.4 **Question:** I have a registration of a design applied to an article. Would this give me exclusive rights to prevent others from using the same design applied to a non-physical product for their businesses?

Answer: The exclusive rights given to the registered owner is for the article in respect of which the design is registered and to which that design, or a design not substantially different from that design. Hence, you do not have exclusive rights to prevent others from using the same design if it is applied to a non-physical product for their businesses. If you would like to obtain exclusive rights, you would have to successfully apply for the registration of the design applied to the non-physical product.