



**1. Contributors**

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Capacity Involved	: Co-Inventor / Co-Originator (UTM Staff)	Postcode/ State	: 81310/ JOHOR

**2. Title of the Invention/ Design/ Representation of trade mark**

Design Framework of Determination of Three-Dimensional Boundary

**3. State the invention. Please choose more than one. (if necessary) to best describe your invention.**

New Use	<input checked="" type="checkbox"/>	An Improvement	<input type="checkbox"/>	A Device	<input type="checkbox"/>
A Process/ Method	<input type="checkbox"/>	A Product	<input type="checkbox"/>	A Mark	<input type="checkbox"/>
A Design	<input checked="" type="checkbox"/>	Software	<input type="checkbox"/>	Others	<input type="checkbox"/>

**4. Brief description of the invention. For trademark, give list of goods/ services.**

Design Framework of Determination of Three-Dimensional Boundary is a new design of establishing the cadastral boundary mark for 3D property (where coordinates x-length, y-width and z-height) are indicated in the cadastral document. As cadastral boundaries are normally marked on the ground (Eriksson, 2005), no specific rules for the marking of boundaries between 3D properties have been introduced. 3D property consists of an enclosed volume which is delimited both horizontally and vertically. This means that the border can often be sketched and identified as in traditional real property. A property's boundaries must therefore be specified or described adequately. 3D property or 3D property space occupies buildings or other premises. The boundaries around the 3D property are deduced in the manner deemed most appropriate in each case; this includes the light to the current building or external boundaries of design. In three-dimensional reorganizing, demarcation can be marked on the ground to denote a volume that is delimited by the soil surface. In the case of 3D property below or above the ground surface, for example caverns or bridges, it may be marked at the ground level if the marking cannot be marked on the 3D spaces surface; such markings are not located in a border point, but it relates to the border. Later, the surveyed coordinates (x, y, z) need to indicated in the cadastral document.

**5. Full Description of invention/ Representation of Design (excluding trademark). Provide drawings and other materials that help illustrate the description, if any**

Design Framework of Determination of Three-Dimensional Boundary is a new concept of establishing the cadastral boundary mark for 3D property (where coordinates x-length, y-width and z-height) are indicated in the cadastral document. As cadastral boundaries are normally marked on the ground (Eriksson, 2005), no specific rules for the marking of boundaries between 3D properties have been introduced. 3D property consists of an enclosed volume which is delimited both horizontally and vertically. This means that the border can often be sketched and identified as in traditional real property. A property's boundaries must therefore be specified or described adequately. 3D property or 3D property space occupies buildings or other premises. The boundaries around the 3D property are deduced in the manner deemed most appropriate in each case; this includes the light to the current building or external boundaries of design. In three-dimensional reorganizing, demarcation can be marked on the ground to denote a volume that is delimited by the soil surface. In the case of 3D property below or above the ground surface, for example caverns or bridges, it may be marked at the ground level if the marking cannot be marked on the 3D spaces surface; such markings are not located in a border point, but it relates to the border. Later, the surveyed coordinates (x, y, z) need to indicated in the cadastral document.

In actual implementations, the boundaries delineating the 3D properties are often drawn in the middle of an intermediate wall or joist. However, there are also other options available. It is vital that the essential documents be thoroughly investigated in each individual case in order to determine how the delineation was made. However, unlike other 3D properties, strata title properties are, to a large extent, owned individually. Hence, a standardized design is necessary so that not only would the extent of the individual buildings be easily identifiable, the rights and obligations connected to the ownership of a strata title property can also be established.

Given the above reasons, a strata title property should be delimited so that it consists of the building space that the property unit covers, including a surface layer. Surface layer thickness, and thus the extension of the property, should be determined so that the effective use of the building and surrounding properties is made possible. For example, the usual interior details of the living space can be mounted without interference of someone else's rights, windows and exterior doors should be included in the buildings.

It is a standard procedure for 3D boundaries of a building to consist of the middle of the wall and the middle of the floor. This ensures that responsibility is indirectly joint for these structural elements, while each one is responsible for the surface layers on their side. There are also supporting structures, such as load-bearing walls, floors and other things to be established as a joint facility. Furthermore, borders should be identified around 3D spaces for each property in practice to obtain the resulting facade or equivalent. Conversely, the easements can be granted for access to the sealing layer and so on. However, the marking of 3D borders does not exist in practical application, with some coordinates displayed being not applicable for 3D buildings.

According to Paulsson (2007), a common solution is to locate the boundary to the center of the wall and joists; another solution is to make joint facilities for these structures. In addition, the boundaries can be described either with reference to the walls, ceilings and floors, which is the usual case for buildings, or be fixed by x, y, and z coordinates for rock shelters and so on (Eriksson, 2005). In addition, when drawing the boundaries, a certain amount of airspace around the building may also be included to provide access for maintenance, or to allow for certain structures protruding from the building, such as antennas, or for smaller future additions. However, how much airspace may be included in a 3D property unit is not clearly stipulated in the Swedish Land and Cadastral Legislation (Paulsson, 2007).

3D property, in normal circumstances, can be defined by coordinates (x, y, z) for the various breakpoints in the property's boundaries. With regard to the boundaries of 3D property below surface, it may often be appropriate to specify the space location by coordinates. In some cases, it may be natural to refer to 3D property or 3D property space in relation to adjoining buildings, either traditional or 3D properties. This is especially true when a facility is divided among several buildings.

It is important that in the 3D property cadastral map, technical and legal descriptions in the land registry clearly indicate how the boundary lies in relation to the building. Property boundaries must also be described in the cadastral maps and verbally indicated where the boundaries are in relation to the proposed building. The basis for reorganizing the decision should be in detail; in principle, it should be equivalent to building permit documents.

Finally, technical and legal description in the land registry for the clarification of the boundaries of the intended building or facility should also be registered. If the buildings have been constructed in compliance with real property regulations, a normative border route for the future and further interpretation would not be required in the graphical presentation. On the other hand, if the building is a 3D property and is not constructed yet when the ruling regarding the reorganization was made, minor modifications to the property boundaries may be necessitated when the building undergoes construction. Therefore, an amendment to the limit in such cases is achieved only through a land measure.

**6. Date, place of invention/ design and by whom invented/ designed**

Date : 01/12/2014  
Place : Universiti Teknologi Malaysia  
Name(s) :  
1. TAN LIAT CHOON  
2. KHADIJAH BT HUSSIN

**7. Prior Art/ Prior Design/ Trademark Search**

a) Is there any earlier work of the same kind of which you know (Prior Art/Prior Designs/Trademark Search). If yes, please include details of and/or attach copies of relevant publications or search report.

No  
Describe briefly the similarities (if any) and differences between the disclosed invention and closet known technology (excluding trademark application).

**8. State the problem that your disclosed invention is solving**

1. Problem : 2D property database without coordinate z-height.  
Solution : With 3D property database with coordinates x-length, y-width and z-height, cubic volume for parcel can be calculated.

9. Past Disclosure/ Publication

Has the invention / design been disclosed or published?

If 'yes', please give details, indicate date of disclosure / publication and attach a copy of the publication.

Date :
Title :
Description :

If 'yes', was a confidential or Non-Disclosure Agreement in place?

Date :
Title :
Description :

10. Intended Disclosure / Publication

Is it intended to disclose details of the invention / design?

If 'yes', please give details and indicate date of intended disclosure / publication.

Date :
Title :
Description :

11. Potential Commercialization (Please complete an InnoComm Evaluate Form at main tab).

List the key commercial benefits of the invention.

Any other relevant information e.g. potential route for commercialization, companies that may be interested, alternative markets that the invention may be used in. etc.

12. Internal / External Funding.

Please give details of All internal or external funding, which has been used in connection with this project, including grants, contracts, studentships, etc.

13. External Collaboration.

Has any of this work been carried out elsewhere?

- Other academic institution
Previous Employment
Industrial Collaborator
Others

Four empty checkboxes for external collaboration options.

If 'yes' please tick as appropriate.

Please give details and attach a copy of any agreement signed.

14. Other relevant information (if any).

The information which is provided on this form will be user by the University to access the ownership of the intellectual property rights, potential third party claims to those rights and obligations to external sponsors. Incorrect or incomplete detail could lead, the reduction or loss of commercialization revenues, or the invalidation of paten applications.

I declare that the information which I have provided in this form is, to the best of my knowledge and belief, correct and complete and that the contributors named are all the original creators of this invention/design. I also agree to cooperate in seeking or other legel protection in the name of Universiti/Institution and in the commercialization of this invention/design. I also confirm that I have notified the University/Institution of any conflict of interest which may exist in relation to the invention.

Signature
Name of Inventor/ Originator TAN LIAT CHOON
Category Main Inventor / Main Originator
Approximate % Contribution 70.0%
Date 25-Jan-2016

Signature
Name of Inventor/ Originator KHADIJAH BT HUSSIN
Category Co-Inventor / Co-Originator
Approximate % Contribution 30.0%
Date

Table with 2 columns: Witnessed by : and Signature of the Director of Research Alliance/ School/ Research Institute/ Center :. Includes rows for Name and Date.



Innovation and Commercialization Centre  
Universiti Teknologi Malaysia

InnoCom Evaluation Systems  
(Researcher)

**a) Project Details**

- i. Project Title : Design Framework of Determination of Three-Dimensional Boundary
- ii. Name of Researcher : TAN LIAT CHOON
- iii. Faculty/ Research Alliance : FAKULTI GEOINFORMASI DAN HARTA TANAH

**b) Evaluation Systems**

Please evaluate and give a score to each of these elements for the technology/ product given. Each technology or product should be scored from 0 (very poor) to 5 (excellent) for each dimension.

**1. Patent Protection (strenght of patent)**

- A broad scope, family of patents, granted worldwide, which covers several interlinked aspects of the technology  5
- A broad scope, single patent, granted worldwide, which covers the fundamentals of the technology, or for a very major suite of softwares that would take many years to duplicate  4
- A broad scope, strong patent application, or an incremental technology or significant new development of existing technology  3
- A narrow scope of patent, less significant development of the existing technology, or extensive know-how  2
- An interesting research result which might be protectable  1
- A bare idea, with no evident uniqueness or protectability  0

**2. Readiness of the technology**

- The technolog is well proven and a process for volume manufacture has already be proven by manufacture of significant quantities (or is trivial, as for example, with software duplication)  5
- The technology has a prototype, successfully completed on field testing with real customers and a small-scale manufacturing proess has been demonstrated.  4
- The technology a prototypes stage, works well in the laboratory, but has not yet been tested by customers. Manufacture seems to be relatively straightforward in theory.  3
- The technology has proof of concepts stage, can be made to work sometimes in the laboratory, though this is still considerable black art in doing it repeatedly. Not much thought has yet been given to larger scale manufacture.  2
- Closely related technologies have been made to work in this lab, and there seems to be no theoretical reason why this one shouldn~t work too (need further research and testings).  1
- The technology should work in theory, but hasn~t yet been tried (ideation stage).  0

**3. Value of the Market**

- The worldwide market for this product and its direct competitors is likely to be in excess of RM1 billion p.a  5
- The worldwide market is likely to be in excess RM100 million p.a  4
- The worldwide market is likely to be in excess RM30 million p.a  3
- The worldwide market is likely to be in excess RM10 million p.a  2
- The worldwide market is likely to be in excess RM3 million p.a  1
- The worldwide market is likely to be less than RM3 million p.a  0

**4. Anticipated profit margins (if considering a license, score on the anticipated royalty rate)**

- The gross profit margin per sale is likely to be over 70% (royalty >7%)  5
- The gross profit margin per sale is likely to be over 50% (royalty >5%)  4
- The gross profit margin per sale is likely to be over 30% (royalty >3%)  3
- The gross profit margin per sale is likely to be over 20% (royalty >2%)  2
- The gross profit margin per sale is likely to be over 15% (royalty >1%)  1
- The gross profit margin per sale is likely to be under 15% (royalty <1%)  0

#### 5. Intensity of Competition in the Market

- This is a brand new market, and there are currently no actual or potential competitors.  5
- The market is relatively new, and the competitors are very small firms which have no current technological or marketing lead.  4
- The market is relatively new, and the competitors are still relatively small, though some may have a small lead in some areas, or have access to significant venture funding.  3
- The market is becoming established, and competitors have grown to medium size (RM5m plus sales p.a.) and gained a reputation as market leaders.  2
- The market is well established, and the competitors are already substantial companies with the ability to quickly adopt or duplicate new technologies.  1
- The market is mature, and is dominated by a few multinational companies with major research capabilities, marketing reach and financial muscle.  0

#### 6. Competitive Edge of your product or service/unique selling point

- The product service is several times as good as the competition in one or more customer-critical areas, and is not worse in any other areas.  5
- The product or service is significantly better than the competition in at least one customer-critical area, and is not worse in other areas.  4
- The product or service is marginally better (e.g. 25% better in at least one customer-critical area), and is not worse in other areas, or is significantly better in one area, but has minor disadvantages in other less critical areas.  3
- The product or service is marginally better (e.g. 25% better) compared to the competition in at least one customer-critical area, but has disadvantages in other less critical-areas.  2
- The product or service has advantages over the competition in one or more areas, but they do not appear to be areas that are critical to the customer.  1
- The product or service has no evident advantages over the competition.  0

#### 7. Ease of access to the Market

- The potential customers worldwide have already been listed (or can very easily be listed) and sales contacts can be initiated as soon as the product is completed, or well-established worldwide distributors are enthusiastic.  5
- The potential customers or enthusiastic distributors can be easily listed in some territories, and it appears that with enough work, other territories can be brought up to the same level.  4
- The potential customers and distributors can be described in general, and there are no evident barriers to accessing them, though generating the lists would be significant work.  3
- It is fairly unclear what the profile of the potential customers is, or the profile is clear but there are some significant barriers (e.g. regulatory approval) to reaching them.  2
- Some potential customers can be described, but there are substantial barriers (e.g. regulatory approval, comply with applicable standards) preventing short-term access to them.  1
- Some potential customers can be described, but the barriers to reaching them are very substantial.  0

#### 8. Commitment and motivation of the team

- The inventors and other members of the team are willing to take risks to leave their current jobs, invest life savings in order to see the commercial opportunity realized (i.e. they form a spin-off company using their own savings at the beginning, to show confidence in their technologies).  5
- The inventors and other members of the team are willing to take full-time leave of absence from their current jobs, and invest meaningful sums (e.g. 25% or more of their annual salary) (i.e. the business model is to form a spin-off company while looking for more funding).  4
- The inventors and other members of the team are willing to spend up to 50% or more of their time on the commercial opportunity, on an agreed split with their current jobs, and to invest modest sums (e.g. 10% or more of their annual salary) (i.e. the business model is to form a joint venture company).  3
- The inventors and other members of the team are willing to spend a small portion of their time (up to 20%) on the commercial opportunity, but are not willing to make even a modest investment. (i.e. the business model is to license the technology to the existing company).  2
- The inventors and other members of the team are willing only to act as consultants, in addition to their normal jobs, providing they are paid consultancy fees, but are not willing to make even a modest investment (i.e. as consultants to the companies that license their technologies).  1
- The investors and other members of the team believe that their research is now finished, and are unwilling to spend any further time on the technologies (assume they have nothing to do with the technologies anymore).  0

#### 9. Business Management and Industry Experience

- The investors and other members of the team had a previous, very successful experience in the management of business(s) in new technology and have broad industry contacts.  5
- The investors and other member of the team had previous, not very successful, experience in the management of business of a new technology, but have strong industry link and feel that they have learnt to do it better next time.  4
- The investors and other members of the team had experience in management of business(s), but the role was relatively narrow (e.g. managing a department, rather than general management) and do not have strong industry contact.  3
- The investors and other members of the team had very little experience in management of the business, (i.e. as an employee) and limited industry contact.  2
- The investors and other members of the team had limited business experience and industry contact.  1
- The investors and other members of the team had no business management experience and industry contact at all.  0

c) **Summary**

No.		Score
1.	Patent Protection (strenght of patent)	0
2.	Readiness of the technology	0
3.	Value of the Market	0
4.	Anticipated profit margins (if considering a license, score on the anticipated royalty rate)	0
5.	Intensity of Competition in the Market	0
6.	Competitive Edge of your product or service/unique selling point	0
7.	Ease of access to the Market	0
8.	Commitment and motivation of the team	0
9.	Business Management and Industry Experience	0
	<b>Total</b>	<b>0</b>
	<b>Total Min</b>	<b>0.0 %</b>



**UTM**  
UNIVERSITI TEKNOLOGI MALAYSIA

Innovation and  
Commercialisation  
Centre  
(ICC)

Pusat Inovasi dan Komersialisasi  
Pusat Industri, Technovation Park  
Universiti Teknologi Malaysia  
81310 Johor Bahru  
Johor, Malaysia

**NABC SCHEME**

<b><u>Opening</u></b>	<b><u>What's The Opening?</u></b>
<b><u>N</u></b>	<b><u>What's the important, quantitative customer and market Need?</u></b>
<b><u>A</u></b>	<b><u>What's the specific, quantitative Approach to satisfying that need?</u></b>
<b><u>B</u></b>	<b><u>What are the Benefits per cost from that approach?</u></b>
<b><u>C</u></b>	<b><u>Who is the Competitor and what are the alternatives now and in future, and why are your benefits per cost superior?</u></b>
<b><u>Closing</u></b>	<b><u>Closing</u></b>