Pointerra Limited

A global platform play in 3D data

Pointerra Limited (ASX:3DP) sells a Cloud-based solution to manage, visualize and share 3D geospatial imaging data. Target customers include companies in the mining, oil & gas, construction and government sectors as well as incumbent providers of laser scanning equipment and 3D data analytics and design software.

A step change in Geospatial Analytics' workflows

3D geospatial datasets can be enormous in size, which makes storage, processing and sharing very cumbersome. The Pointerra platform allows users, such as engineers, architects and planners, to store, retrieve and view these massive data sets much more easily and substantially faster, which brings tremendous efficiency gains to the industry. Pointerra essentially greases the wheels of the Geospatial Analytics industry's workflows.

Collaborative business model to drive industry adoption

3DP itself does not provide data analytics software or 3D scanning hardware, nor does the company capture 3D data itself. Rather, 3DP provides a highly scalable hosting and management service for 3D data in the Cloud that customers can subscribe to.

Pointerra, the company's high margin Data-as-a-Service (DaaS) offering, is complementary to large incumbents' existing workflow solutions, such as Lidar laser scanning equipment and 3D analytics and design software. The solution can be integrated into these existing products facilitating much faster and easier access to massive 3D data sets than is currently possible, which is creating a pull effect for 3DP on the part of Geospatial Analytics hard- and software providers, looking to integrate Pointerra into their products and essentially becoming resellers of the product.

Additionally, platform is currently being rolled out commercially in the US, Europe and ANZ through 3DP's nimble direct sales team. The company's current cash position should see it through to cash flow break even due to 3DP's low cost base.

Starting coverage with a BUY rating and a A$0.08 price target

We consider 3DP to be a global platform play for 3D geospatial data with very high operating margin potential, i.e. in excess of 60% longer term. Based on our valuation methods, we see substantial upside potential for 3DP's share price. Consequently, we start our research coverage of 3DP with a Buy recommendation and a price target of A$ 0.08 per share.

		(A$ M)	FY16A	FY17E	FY18E	FY19E
Number of shares (m)	326	Revenues	0	0.04	2.6	5.7
Number of shares FD (m)	593	EBITDA	-0.9	-1.8	-0.2	2.2
Market capitalisation (A$ m)	11.7	NPAT	-2.8	-1.7	-0.1	1.6
Free Float (%)	64%	EPS FD	-0.005	-0.003	0.000	0.003
12 month high/low A$	0,049/0,017	EV/EBITDA	N/A	N/M	N/A	3.6
Average daily volume (k)	771	EV/Sales	N/A	N/M	3.6	1.4

Profit & Loss account

	FY16A	2017E	2018E	2019E
Revenues	0.0	0.04	2.6	5.7
EBITDA	-0.9	-1.8	-0.2	2.2
EBITDA %	*N/A*	*N/A*	*-7.0%*	*37.8%*
Depreciation & Amortisation	0.0	0.0	0.0	0.0
EBIT	-0.9	-1.8	-0.2	2.2
EBIT %	*N/A*	*N/M*	*-7.0%*	*37.7%*
Interest income & expense net	0.0	0.1	0.1	0.1
Other items	-1.9	0.0	0.0	0.0
Profit before Tax	**-2.8**	**-1.7**	**-0.1**	**2.2**
Taxes	0.0	0.0	0.0	-0.7
Net earnings	**-2.8**	**-1.7**	**-0.1**	**1.6**
Ordinary shares outstanding	326	326	326	326
Fully diluted # shares	593	593	593	593
Earnings per share	**-0.008**	**-0.01**	**0.000**	**0.005**
Earnings per share fully diluted	-0.005	0.00	0.000	0.003

Cash Flow Statement

	FY16A	2017E	2018E	2019E
Net income P&L	0.0	-1.7	-0.1	1.6
Depreciation & amortisation	0.0	0.0	0.0	0.0
Impairments	0.0	0.0	0.0	0.0
Change in working capital	0.0	-0.8	0.0	0.0
Other items	0.0	0.0	0.0	0.0
Cash flow from operations	**0.0**	**-2.5**	**-0.1**	**1.6**
Net cash flow from investments	**0.07**	**-0.03**	**-0.03**	**-0.04**
Dividend paid	0.0	0.0	0.0	0.0
Change in equity	4.4	0.0	0.0	0.0
Change in debt	0.0	0.0	0.0	0.0
Other items	0.6	0.0	0.0	0.0
Cash flow from financing	**5.0**	**0.0**	**0.0**	**0.0**
Net cash flow	**5.1**	**-2.5**	**-0.1**	**1.5**

Balance Sheet

	FY16A	2017E	2018E	2019E
Current assets				
Cash and marketable securities	5.1	2.6	2.5	4.0
Accounts receivable	0.0	0.0	0.2	0.5
Inventories	0.0	0.0	0.0	0.0
Other current assets	0.0	0.0	0.1	0.3
Total current assets	**5.1**	**2.6**	**2.8**	**4.7**
Fixed assets				
Net property, plant & equipment	0.0	0.0	0.1	0.1
Goodwill	0.0	0.0	0.0	0.0
Other intangible assets	0.0	0.0	0.0	0.0
Other assets	0.0	0.0	0.0	0.0
Total fixed assets	**0.0**	**0.0**	**0.1**	**0.1**
Total assets	**5.1**	**2.6**	**2.9**	**4.8**
Current liabilities				
Short-term debt	0.0	0.0	0.0	0.0
Accounts payable	0.01	0.8	0.0	0.2
Dividends payable	0.0	0.0	0.0	0.0
Other current liabilities	0.0	0.0	0.0	0.1
Total current liabilities	**0.8**	**0.1**	**0.4**	**0.8**
Long-term debt	0.0	0.0	0.0	0.0
Total provisions	0.0	0.0	0.0	0.0
Total group equity	**4.3**	**2.6**	**2.5**	**4.0**
Total liabilities and equity	**5.1**	**2.6**	**2.9**	**4.8**

Valuation

	FY16A	2017E	2018E	2019E
Relative valuation				
P/E (reported)	N/M	N/M	N/M	7.5
P/B	2.3	4.6	4.7	2.9
P/CF	N/M	N/A	N/A	7.5
Price to sales	N/A	N/M	4.6	2.0
EV / sales	N/A	N/M	3.6	1.4
EV / EBITDA	N/A	N/M	N/A	3.6
Dividend yield	0.0	0.0	0.0	0.0
EV / Common equity	1.1	3.6	3.8	1.9

Discounted Cash Flow
Assumptions

Long term interest rate	2.5%
Risk premium	4.3%
Marginal tax rate	30%
Long term growth	3%
Leveraged Beta	1.27
Implied WACC	*9.3%*
TMT Analytics applied WACC	15%
DCF fair value range per share	A$ 0.10

Profitability ratios

	FY16A	2017E	2018E	2019E
Return on Equity	-64%	-67%	-3%	39%
Return on Assets	-54%	-66%	-3%	32%
Return on Invested Capital	N/M	N/M	N/M	1384%
EBITDA margins	N/A	N/A	-7.0%	37.8%
EBIT margins	N/A	N/M	-7.0%	37.7%
Net margins	N/A	N/M	-3.2%	27.1%

Financial Strength

	FY16A	2017E	2018E	2019E
Net debt (cash)	-5.0	-2.5	-2.4	-3.9
Net debt / Equity	-1.2	-1.0	-1.0	-1.0
Net debt / EBITDA	5.8	1.4	13.4	-1.8
Interest coverage	N/M	N/M	N/M	N/M

Capital Structure

Ordinary shares	326
Performance shares	165
Options and warrants (m)	102
Fully diluted	593
Market capitalisation (A$ m)	11.7
Market cap. fully diluted (A$ m)	21.3
Free float %	64%
12 month high/low A$	0,049/0,017
Average daily volume (k)	771.0

Source: Factset, TMT Analytics

A global platform play in 3D data

Hosting 3D data sets in the Cloud

Pointerra Limited (ASX:3DP) has developed a cloud-based solution to manage, visualize and share 3D geospatial imaging data that is generated by surveyors on the ground, light airplanes and drones equipped with scanning equipment. More specifically, Pointerra hosts massive 3D data sets, also known as point clouds, generated by Lidar scanning equipment (Figure 1).

FIGURE 1: LIDAR SCANNING METHODS: LIGHT PLANE, SURVEYORS AND DRONES

Source: LIDAR-America.com, Total Earth Solutions, TMT Analytics

Laser used to map land, infrastructure, buildings and installations

Lidar stands for "Light Detection And Ranging" or "Laser Imaging Detection And Ranging". Lidar is a surveying method that measures distance to a target by illuminating that target with a laser light. The time it takes the laser light to travel to the target and back to the scanner is used to measure the distance to the target. That particular point is plotted on a map along with millions of other points. These individual points make up the 3D point cloud which is then used to generate high-resolution maps and images, e.g. geological maps and infrastructure (Figure 2).

Point clouds can have different attributes such as the xyz coordinates within a 3D picture, Red, Green and Blue (RBG) color codes and geo references.

FIGURE 2: LIDAR IMAGERY USED TO GENERATE 3D REPRESENTATIONS
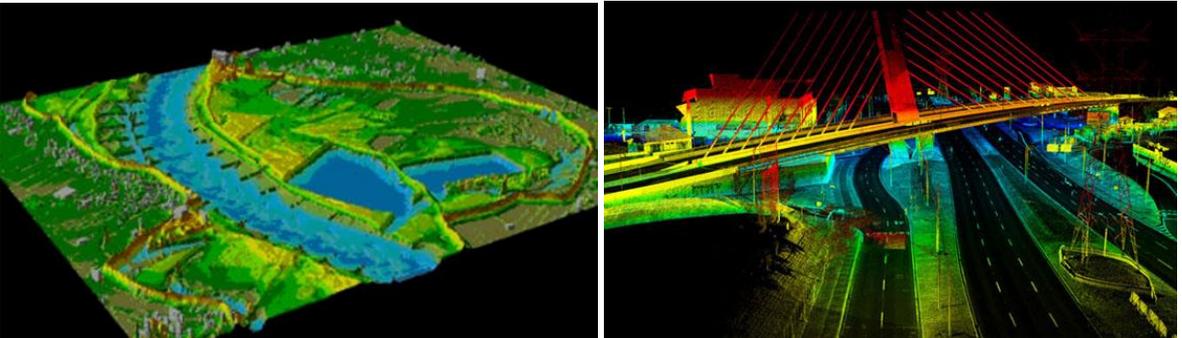
Source: BAE Systems, TMT Analytics

3D maps widely used across industries and governments

Point clouds are used in many sectors, such as Mining, Energy, Construction and Infrastructure. Furthermore, many governments run a geological department, e.g. the United States Geological Survey (USGS), Geoscience Australia and Land Information New Zealand (LINZ). These departments collect geological information for government use and typically make this information available for public use as well.

In a specific example, a construction company may use 3D imagery illustrated in Figure 3 to model and plan an extension or modification to a highway overpass.

FIGURE 3: 3D POINT CLOUD IMAGES OF A HIGHWAY PASSOVER

Source: Pointerra, TMT Analytics

As a first step, the survey data is collected (Figure 4) through a land-based surveyor and/or airborne scanner (plane, drone). The raw data is then processed to make it manageable for engineers and architects, e.g. color is added and the data is geo-referenced. The 3D data is subsequently used by engineers and architects in software suites, such as AutoCad and MicroStation, to design the new features into the existing overpass.

FIGURE 4: GEOSPATIAL ANALYTICS 3D DATA COLLECTION AND PROCESSING WORK FLOW
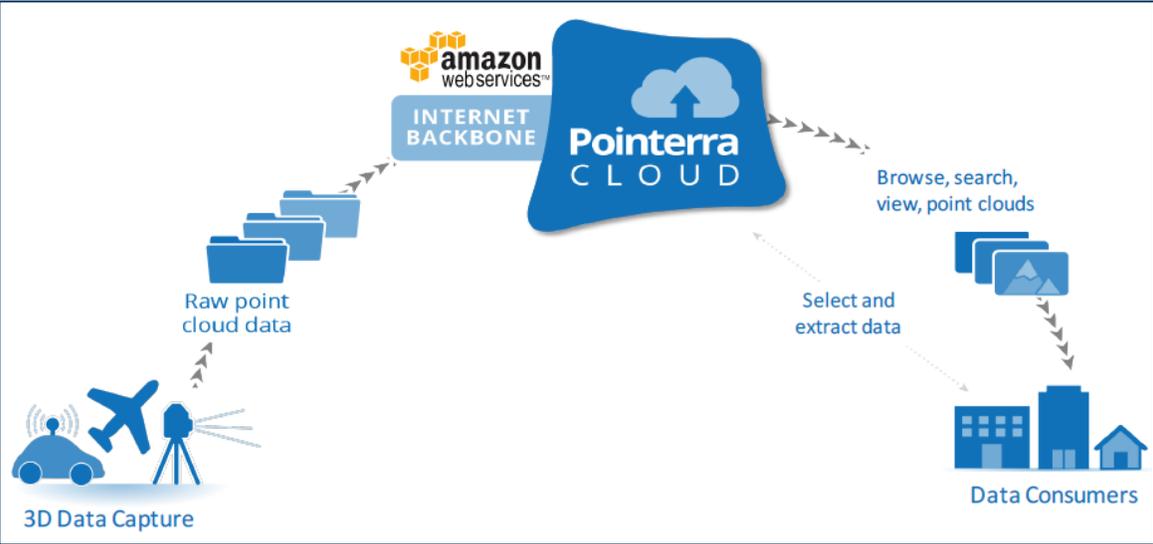
Source: Pointerra, TMT Analytics

3D point clouds are extremely useful, but massive in size

It will be obvious from the example above that 3D point clouds are an indispensable design tool for engineers, architects, planners etc. Furthermore, it's easy to see the use cases in a wide range of different environments, such as oil and gas installations, mining and construction sites as well as city planning.

However, managing 3D point cloud data files is very cumbersome due to large file sizes and the fact that surveyors typically provide scanning data in multiple files rather than just one.

Even small 3D point cloud data files can be very large

Scanning a large house or a small building using Lidar can generate a point cloud of approximately 1BN points. The approximate file size of a point cloud with 1BN points ranges from 30GB to 50GB of uncompressed data, depending on the level of detail required.

Scanning larger structures logically generates larger numbers of points. Point clouds in excess of 5BN points, implying an uncompressed file size of around 200GB, are quite common.

Existing 3D design software can't cope with such large data files

AutoCAD Civil 3D is Autodesk's 3D design software suite for civil engineering purposes. We estimate the latest version of Civil 3D is able to display a maximum of approximately 30M to 40M points for all point clouds attached to a particular drawing. In other words, users can only work on sections of a particular project if the point cloud exceeds 40M points. They will need to load other sections into their workstation instead of being able to work on that project in its entirety.

Sharing and rendering very large 3D data files can be unwieldly

Given their large size, sharing point cloud data files across the internet can be a lengthy process. In fact, some 3D data files are so large, they are sent on flash drives by express mail or courier. Furthermore, rendering large 3D maps in current software suites can take up to one hour in some instances.

Even though software vendors have made some progress in 3D data management in recent years, e.g. through improved compression techniques, currently there is no cheap, fast and efficient way to manage, distribute and visualize large 3D data sets.

Consequently, the existing inefficiencies in 3D data management and 3D design have persisted in the relevant industries for many years.

3DP's technology is a step change in 3D data management

In a nutshell, 3DP makes 3D data files better manageable through smarter data handling and encoding. Additionally, the company developed a novel way to render 3D data sets enabling display on thin clients such as tablets and mobile phones (in addition to regular desk tops) making 3D images available on-the-go, for instance for surveyors and field engineers etc.

Pointerra's patent-pending secret sauce

Firstly, the company's proprietary compression techniques reduce a raw data file by approximately 80% to 85%. This is done through a patent-pending methodology to partition spatial data structures in such a way that they are more efficiently stored and retrieved.

Additionally, 3DP's method enables faster access to 3D data while compressed (encoded) than other methods, enabling data manipulation in compressed form.

Secondly, 3DP employs a 3D image rendering methodology that omits certain data points that may not be relevant for a user's current view of a 3D image, but which need to be "on hand" in case the user changes perspective on his screen. While existing 3D software works in a similar way, 3DP has taken this principle a step further, resulting in substantially faster 3D image rendering. This aspect of the company's technology is also patent-pending. A more detailed description of the company's technology is provided in the appendices.

### The benefits of 3DP's technology are threefold

Compared to existing solutions on the market today, 3DP's technology has three important advantages:

- Faster querying, i.e. accessing certain parts of a 3D map;

- Very rapid data processing and image rendering on screen, resulting in substantially more efficient workflows, both in office environments and in the field;

- Lower storage costs due to substantially smaller datasets (just 15% to 20% of the original file size). Even though data storage costs decline rapidly year after year, file sizes for 3D geospatial information can go up to hundreds of GB's, even Terabytes (TB) in case of large projects, so compression is very important.

3DP's Cloud-first design is crucial element of its solution

A crucial element of 3DP's approach to 3D data management and processing is the Cloud-based design of the Pointerra platform. Rather than running a large and resource-intensive computer program on a local desktop, Pointerra was designed to be a Cloud-first solution and runs on AWS (Amazon Web Services).

FIGURE 5: POINTERRA'S POSITION IN THE GEOSPATIAL ANALYTICS ECOSYSTEM
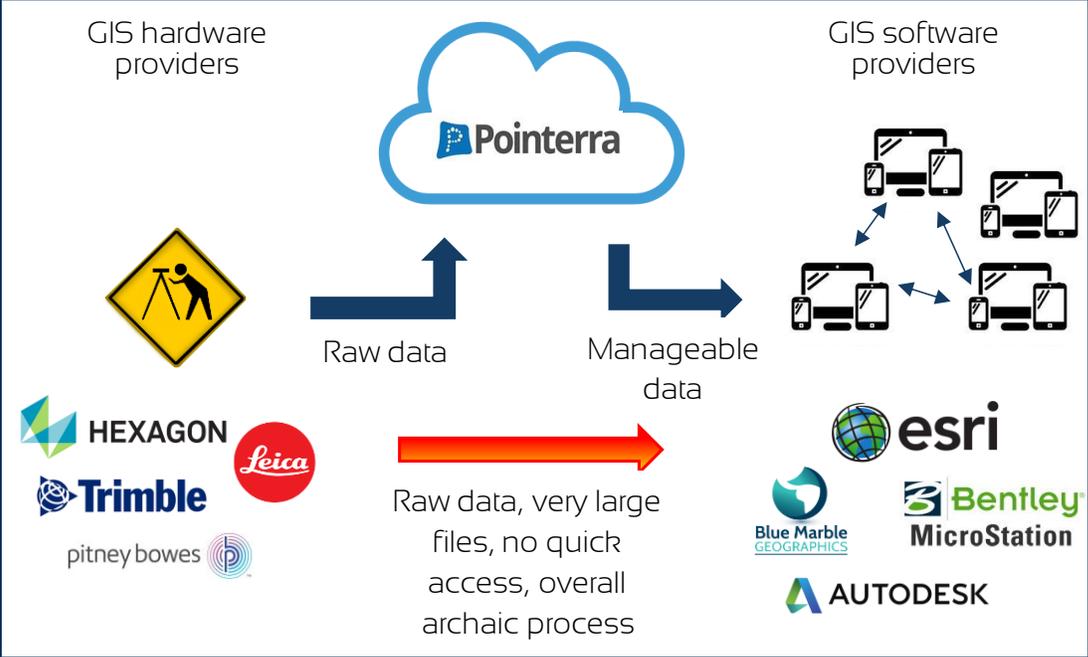
Source: TMT Analytics

The Cloud is front and center

The implications of this Cloud-based design are very far-reaching. As datasets get larger, the flexible AWS infrastructure allows 3DP to add more servers when needed. This enables parallel processing on AWS' servers, versus sequential processing on desktop computers. So even with very large datasets, e.g. comprising of 100BN points, data delivery speeds across the internet to user screens are still very high.

So regardless of the size of the data set, be it 10M points or 10BN, Pointerra is scalable with larger datasets. This is generally not possible with existing 3D software, such as AutoCad and MicroStation, which run on local desktops and are currently limited to processing approximately 40M points simultaneously.

Additionally, because data hosting and most of the data management is done off-board, i.e. not on the local computer, even thin clients with limited processing power, such as mobile phones and tablets, can be used to access and view 3D data sets.

> *We believe this scalable, platform, aspect of Pointerra is extremely important as it enables 3DP to commercialize globally and through several different revenue channels, as we will allude to below.*

Greasing the wheels of the Geospatial Analytics industry

When it comes to engaging with the 3D Geospatial Analytics ecosystem, it is important for readers to understand where the company sits in the value chain. Rather than provide 3D design software, 3DP "merely" facilitates hosting, management and sharing of 3D data, i.e. the company does not compete directly with either the hardware or software incumbents in this industry. Rather, the Pointerra platform sits in between the various 3D industry verticals (Figure 5), greasing the wheels of the Geospatial Analytics industry.

> *3DP does not provide design software, but rather provides 3D Data-as-a-Service that is complementary to large incumbents' existing solutions. Consequently, we believe these incumbents consider 3DP a partner within the Geospatial Analytics value chain rather than a threat.*

Why industry incumbents have not developed similar technology

Given enough time, theoretically 3DP's technology could potentially be replicated by incumbent players with deep pockets, by circumventing 3DP's pending patents. However, to date none of the incumbents, both on the hardware and the software side of the Geospatial Analytics value chain, have attempted to develop a full-fledged Cloud-based data hosting solution.

We believe the reasons for this are quite straightforward. Incumbent Geospatial Analytics industry players have their roots in hardware (i.e. scanners etc) or desktop-based 3D design software. Hosting and managing 3D data in the Cloud has never been their core business.

Furthermore, with regards to the software players, their desktop-based software solutions are difficult to migrate to the Cloud given their legacy desktop-based software design structures. Simply put, we believe it is simply too much of a hassle for 3D design software players, like AutoDesk and Bentley, to rebuild their software suites and migrate their entire solutions to the Cloud, especially now with the Pointerra Platform available to be integrated into existing 3D design software.

In other words, we believe there is little incentive for incumbents to develop their own full-fledged Cloud based hosting and storage technology.

3DP is a partner rather than a threat within the GA ecosystem

3DP is both hardware and software vendor agnostic, i.e. Pointerra ingests the surveying data that is presented in the industry-standard .LAS format and hosts it on its platform. This hosted data is then made available to authorized users who may either access this data through their 3D design software to process the data or through a web browser for viewing purposes.

Given that 3DP doesn't infringe on either the hardware or software side of the value chain, we believe the company is considered to be a partner rather than a competitor in the Geospatial Analytics ecosystem. The company's business model is actually tailored to partner with the incumbents in a "Powered by Pointerra" type integration.

Opportunity to become Geospatial Analytics industry standard for 3D data sharing

We believe 3DP's unique, non-threatening position within the Geospatial Analytics industry potentially presents the company with an opportunity to become the de facto 3D data sharing standard in this industry. A key requirement will be for the network effect to kick in, i.e. 3DP will need to attract a critical mass of users to the platform ensuring the value of using Pointerra increases with each additional user coming onto the platform.

It may take 3DP quite some time to reach this stage, if at all, but it is certainly not beyond the realm of possibilities, in our view. Especially if the company can collaborate closely with some of the large incumbents, both on the hardware and software side of the Geospatial Analytics spectrum.

## Addressable market is very substantial and growing fast

A narrow definition of the global addressable market implies a market size of approximately US$ 10.5BN in 2017 for Geographic Information Systems (GIS), growing by about 11% per year to nearly US$ 15BN by 2020, according to P&S Market Research (Figure 6). The GIS market is broken up into Hardware (surveying equipment), Software (3D software), Data and Services & Integrations components, with the data component typically accounting for about 5% of the overall market value. GIS has direct applications in the field of a.o. engineering, planning, management, transport/logistics, insurance and telecommunications.

The broader Geospatial Analytics market is growing by 19% annually

However, a broader definition of 3DP's addressable market is the Geospatial Analytics market, which goes beyond GIS and integrates GIS applications into mainstream technologies, i.e. it expands the applicability of the geospatial technologies quite substantially.

The Geospatial Analytics market includes segments such as GPS and remote sensing as well as GIS and has applicability in sectors, like surveying, medicine and public safety, disaster risk reduction and climate change adaptation. The global Geospatial Analytics market was worth US$ 30.7BN in 2016 and is forecast to grow by more than 19% CAGR to nearly US$ 74BN through 2021, according to Research & Markets.

FIGURE 6: POINTERRA'S ADDRESSABLE MARKET SIZE AND GROWTH (US$ BN)
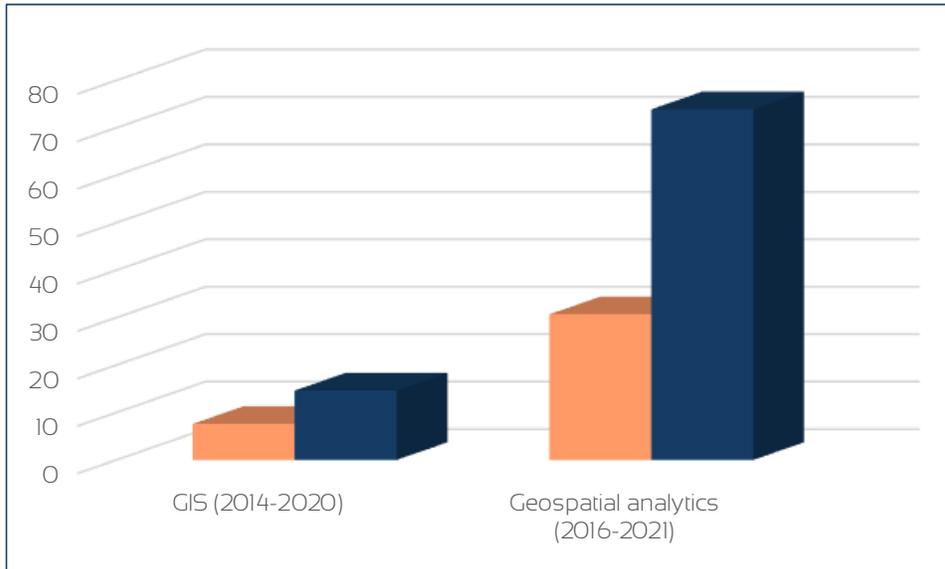
Source: P&S Market Research, Research & Markets, TMT Analytics

Fast access to readily available 3D data is overarching driver for 3DP

Regardless of market definition though, we believe the key driver for 3DP is the fact that all geospatial industry segments require faster and more convenient access to 3D data sets.

In our view, this industry is only just starting to move from locally stored, and thus highly fragmented, 3D data to Cloud-based storage and access solutions.

Ten years of legacy 3D data present a "catch up" growth opportunity

Therefore, in addition to the double-digit market growth for both GIS and the broader Geospatial Analytics markets, we believe there is substantial growth to be captured by 3DP from a "catch up effect", i.e. approximately ten years' worth of legacy 3D data, stored locally and in a fragmented manner will need to be moved to readily accessible Cloud storage in coming years if it is to remain useful.

New technologies require more storage capacity

Additionally, newly emerging Lidar scanning technologies, such as Geiger-Mode and Single-Photon Lidar, enable substantially wider 3D imagery capture areas, while Waveform Lidar offers much richer data attribution options. These technologies require more storage capacity than traditional linear Lidar scanning.

In other words, we would regard the 19% annual growth rate of the Geospatial Analytics market as a very conservative, bare minimum, underlying market growth rate for 3DP in the next five years as the company rolls out its commercial Data-as-a-Service model.

Given that the company has just started to roll out its DaaS solution commercially, we expect 3DP to grow substantially faster than 19% y-o-y in that same time frame.

Multiple potential revenue streams for 3DP

Based on the above we have identified seven potential revenue streams for 3DP, some of which are already gaining momentum and some that require the company to put several building blocks in place first.

1. **Direct sales to 3D data collectors**, i.e. surveyors, drone operators, aerial mappers etc. 3DP is targeting this group of Geospatial Analytics professionals in the United States, Australia, New Zealand and several Western European countries, including the United Kingdom, Scandinavia, Germany and France. Globally, this group of prospects numbers in the thousands.

   3DP's revenue model for this group is based on a per user/per month fee plus a fee for data storage, i.e. 3D project data. While surveyors typically require just a few user logins, ARPU (average revenue per user) should grow over time as more 3D data is stored using the Pointerra platform. Total revenue per client is estimated between US$ 500 - US$ 5,000 per month, depending on number of users and their storage requirements.

2. **Indirect sales through surveyors in a revenue sharing arrangement.** Surveyors' customers, such as architects, construction companies, city planners etc, require storage and access to 3D data sets once these data sets are delivered after the commissioned scanning projects are completed by the surveyor.

   Hosting capacity for these 3D data sets can be sold through surveyors for prices ranging from US$ 50 - US$ 1,000 per month depending on the size of the data set. 3DP will provide a revenue share to these channel partners of 20%.

3. **Direct enterprise sales to large end-customers**, such as mining companies, government organizations (transportation and geological departments), oil & gas companies etc. These companies employ in-house surveyors and typically require 5 to 10 user logins.

   Additionally, they usually have high storage requirements given the size of their assets, e.g. civil infrastructure, oil & gas installations, buildings etc. 3DP anticipates monthly recurring revenues from each of these enterprise clients in the range of US$ 5,000 to US$ 10,000.

4. **Indirect enterprise sales through channel partners and resellers in a revenue sharing arrangement.** This revenue opportunity involves engineering firms and large Geospatial Analytics consultants integrating Pointerra into their solutions. 3DP can subsequently sell 3D data hosting and storage capacity to channel partners' end customers for a monthly recurring fee that depends on the number of concurrent users and required storage capacity. We expect 3DP will be able to negotiate revenue sharing agreements with these channel partners.

5. **Revenues from third party API integration.** Similar to revenue stream 4, but higher up in the value chain, this potential revenue stream involves Geospatial Analytics incumbents on both the hardware and software end of the spectrum integrating a Pointerra API (Application Programming Interface) into their solutions, which enables their end customers to include Pointerra in their workflow. For instance, a Lidar scanner manufacturer or software provider can include this API into their solution, providing customers a seamless experience inside the application when storing and retrieving 3D data sets.

   In terms of pricing, 3DP anticipates it will be able to charge the Geospatial Analytics channel partner an upfront fee for API integration, which we estimate can range from approximately US$ 50,000 to US$ 200,000. Additionally, 3DP will require a revenue share of each sale of subscriptions and storage capacity.

6. **Revenues from existing 3D data libraries.** Over the years, the United States Geological Survey (USGS) has collected around 70TB (70,000GB) of geological survey data. While this data is freely available to download, it is scattered across different government websites. Furthermore, point cloud data of a single object or location can be spread out over multiple files. Many other countries have similar geological survey data available. Locating, accessing and sharing this 3D data can be quite cumbersome.

   By the middle of 2017, 3DP aims to launch a 3D data library in the Pointerra cloud environment, which will include 3D data sets from Western governments, i.e. ANZ, North America and Western Europe. This data will be available for a fee per data set, estimated between US$ 25 and US$ 100, which we believe is an attractive price point for professional users who would otherwise have to search, access and store this data themselves using archaic methods.

7. **Revenue from an online marketplace for 3D data, similar to an App store.** A longer-term initiative for 3DP would be to set up an online marketplace for 3D data where owners of 3D point clouds can upload and sell their data sets, for instance to partially recoup the costs of commissioned surveying for one of their assets. 3DP would clip the ticket, e.g. 30% of the selling price.

   Currently, selling proprietary point cloud data is not common practice for asset owners and will likely require a change in thinking on their part. Consequently, we believe it will likely take several years before this potential revenue stream will become material.

FIGURE 7: 3DP REVENUE PROJECTIONS (IN US$)
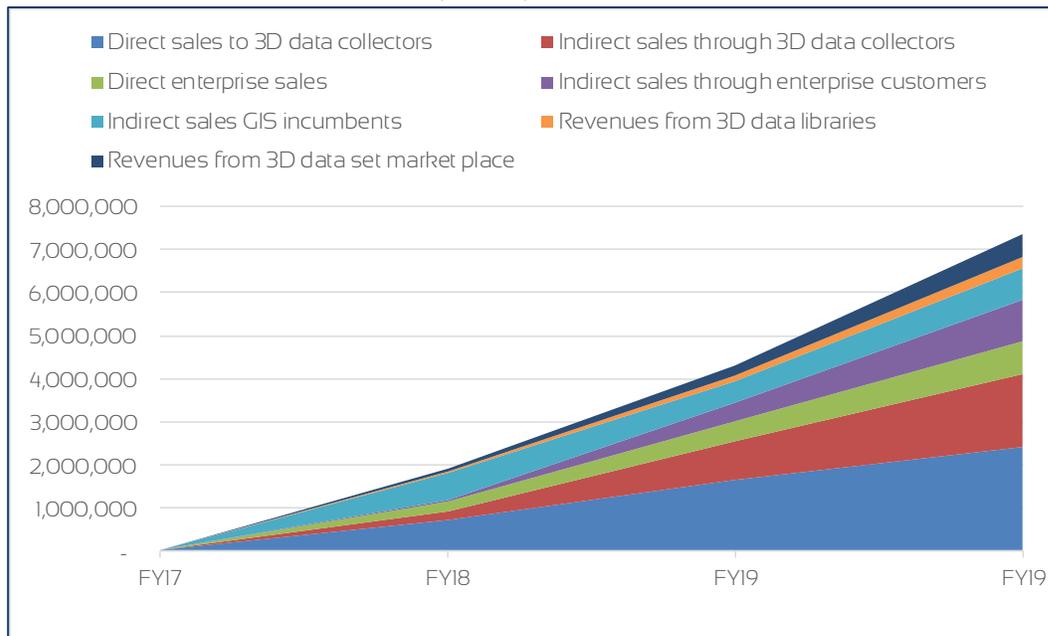
Source: TMT Analytics

As illustrated in Figure 7, we anticipate sales to and through 3D data collectors (surveyors) to make up the bulk of 3DP's revenues over time, i.e. sales to surveyors, architects, engineers, city planners etc. However, the company is in the early stage of its commercialisation phase and it may turn out that one of the other revenue streams will be commercially more successful.

High dependency on channel partners is a double-edged sword

The nature of these various revenue streams implies a relatively high dependency on third party resellers and channel partners, which potentially exposes 3DP to the risk that its commercial potential could be inhibited if one of its more important channel partnerships is not working out as planned or hits a snag.

On the other hand, this go-to-market model ensures high commercial exposure to many different market segments globally, and fast roll out, at very limited marketing and sales costs.

3DP's business model: Designed to partner with incumbents

While 3DP focuses on hosting, handling and sharing of 3D data sets, incumbent suppliers to the GIS and Geospatial Analytics market have traditionally focused on either hardware, to collect 3D data, or software to manipulate this data through desktop-based 3D design, mapping and analytics software.

Pointerra is complementary to incumbents and non-threatening

From the outset, 3DP has designed the Pointerra platform to be Cloud-based and collaborative in nature. I.e. as previously discussed, Pointerra sits in between the various links of the 3D data value chain in a facilitating role and is highly complementary to both the existing hardware and software solutions.

In fact, we believe Pointerra can be considered an extension to these solutions, where the 3D data hosting, managing and retrieval component of a partner's software suite could be "powered by Pointerra".

Partnerships will be crucial in commercial roll out

Given 3DP's strong focus on partnering with established players in the Geospatial Analytics market and the company's current size and level of financial resources, we believe the quality of its current and future partnerships with industry players will be crucial in commercializing the Pointerra platform.

Partnerships and customer trials are progressing well

To date 3DP has been able to secure a number of partnerships and trial agreements with high profile industry players:

Integrated into Esri's ArcGIS software suite

In November 2016, 3DP completed the integration of Pointerra into ArcMap, which is part of Esri's ArcGIS mapping and analytics software suite for the Geospatial Analytics market. Esri is a global player in GIS software with revenues in excess of US$ 800M. Therefore, we believe completion of this integration was a major milestone for 3DP and may turn out to become one of the company's key partnerships going forward.

Joint marketing MOU with Worley Parsons' business unit

In a recent announcement, 3DP advised it signed a Memorandum of Understanding (MOU) with Advisian Digital Enterprise, a business unit of Worley Parsons. Advisian is a technical consulting firm to the hydrocarbons, infrastructure, minerals, metals and chemicals sectors. As such, 3D Geospatial Analytics forms an important part of its activities. Under the MOU, 3DP and Advisian will jointly target prospects in these markets.

Trial license agreement with CRC for Spatial Information (CRCSI)

Australia's Cooperative Research Centre Program (CRC) signed a trial license agreement with 3DP to integrate the Pointerra platform with its QA4LiDAR quality assurance (QA) tool. This tool provides detailed multi-vendor QA assessments of large point cloud datasets.

CRCSI's QA4LiDAR software also uses Esri's ArcGIS tools, which underlines the interconnectedness of the 3D data world and the opportunity for 3DP to approach prospects from different angles. QA4LiDAR with the Pointerra extension may potentially be used by Australian and New Zealand government organizations.

Blue Marble integration to generate multiple revenue streams

3DP recently completed integration of Pointerra into Global Mapper, Blue Marble Geographics' Geospatial Analytics product. Blue Marble has many thousands of customers that will now be able to browse the company's open libraries of 3D Lidar data of the continental US, using Pointerra as the gateway to access this data. This service will initially be sold into the US market and should generate revenues for 3DP from Global Mapper data library sales as well as from Blue Marble promoting the use of Pointerra to its customer base.

Trial license agreement with CR Kennedy with potential for reselling agreement

CR Kennedy (CRK) is one of the largest importers and distributors of 3D laser scanning equipment in Australia, specifically from Leica and Riegl. CRK is currently trialing 3DP's technology and may potentially agree to become a Pointerra reseller to its client base of surveyors and asset owners. If CRK moves beyond the current trial stage towards a full license, it will provide 3DP with a major inroad into the surveying and asset owner market in Australia and New Zealand.

Multiple new surveyor customers signed in recent weeks

Just in the last few weeks, 3DP converted multiple non-enterprise customers, that were trialing Pointerra, into full-fledged paying customers. These surveyors are active in terrestrial and aerial 3D data capturing for the geospatial sector through ground surveying as well as through unmanned aerial systems (UAS) and unmanned aerial vehicles (UAV), i.e. drones.

In addition to these direct sales, these customers are incentivized to resell Pointerra to their client bases of architects, city planners, engineers etc, through revenue sharing agreements with 3DP, i.e. the earlier described revenue stream 2. We consider this group of Pointerra clients to be instrumental in creating a network effect for 3DP over time.

Partnerships allow for very asset-light operations

Given 3DP's strong focus on partnering with channel partners and incumbents, the company has been able to operate a very asset-light business model, i.e. with limited sales staff and minimal capital investments. While we expect expansion of the company's sales teams in the various geographies it operates in over the next months and quarters, we are not anticipating strongly rising staff costs or capex in the next two years.

Revenue model assumptions

Our revenue model for 3DP is built using the seven anticipated revenue streams we described earlier. We have used the following assumptions:

- Direct sales to 3D data collectors (surveyors) yield an average revenue of US$ 1,000 per month (3DP price quotes are in US$).

- The number of surveyor customers grows from 10 in 4Q17 (June quarter) to 230 by the end of FY20.

- Indirect sales by these surveyors to their customers, such as architects and city planners, yields an average of US$ 125 per month per customer.

- We have further assumed that the average number of end customers each surveyor sells the Pointerra solution to will rise from 2 in 1Q18 to 8 by the end of 2020, with 80% of these revenues flowing to 3DP.

- Regarding Enterprise sales to oil & gas, mining companies and large technical consultancy firms, we assume 3DP will be able to generate an average fee of US$ 5,000 per month per customer.

- The number of Enterprise customers is assumed to grow from 1 in 1Q18 to 14 by the end of FY20, i.e. in three years' time.

- We further assume that these Enterprise customers, consultancy firms in particular, will be able to resell Pointerra to their client base for an average fee of US$ 500 per month, 80% of which is assumed to flow to 3DP.

- We assume these Enterprise customers to be able to resell Pointerra to an average number of 2 end customers in 2Q18, rising to an average of 21 by the end of FY20.

- Revenues from API integrations into existing software solutions from Geospatial Analytics incumbents is assumed to generate an ARPU of US$ 15 per month from end users of this software in straightforward Software-as-a-Service models these Geospatial Analytics incumbents already have in place. We assume 80% of these revenues to flow to 3DP.

- Furthermore, we anticipate 3DP to charge these Geospatial Analytics incumbents an upfront license fee of US$ 100,000 per API integration.

- Regarding revenues from open source 3D data libraries, we have assumed an average price per data set sold of US$ 50 with the average number of monthly transactions through this sales channel growing from 25 in 1Q18 to 550 by the end of FY20.

- Finally, regarding the market place for proprietary 3D data sets we have assumed an average price per data set of US$ 2,000 with the average number of transactions growing from 3 per month in 1Q18 to 100 by the end of FY20.

These assumptions result in the following revenue forecasts (Figure 8).

FIGURE 8: 3DP REVENUE MODEL SUMMARY (US$)

	FY17	FY18	FY19	FY19
Direct sales to 3D data collectors	30,000	720,000	1,650,000	2,430,000
Indirect sales through 3D data collectors	-	187,500	882,000	1,675,500
Direct enterprise sales	-	240,000	480,000	750,000
Indirect sales through enterprise customers	-	52,800	439,200	988,800
Indirect sales GIS incumbents	-	621,060	481,360	702,680
Revenues from 3D data libraries	-	41,250	145,500	291,000
Revenues from 3D data set market place	-	68,400	234,000	531,000
	30,000	1,931,010	4,312,060	7,368,980

Source: TMT Analytics

These revenue forecasts translate into the P&L summary in Figure 9.

FIGURE 9: 3DP'S KEY P&L LINE ITEMS

A$ M	2017F	2018F	2019F	2020F	2021F
Revenues	0.04	2.6	5.7	9.8	14.7
EBITDA	-1.8	-0.2	2.2	5.9	10.2
EBITDA margins	N/M	-7%	38%	60%	70%
NPAT	-1.7	-0.1	1.6	4.2	7.3
EPS fully diluted (c)	-0.003	0.000	0.003	0.007	0.012

Source: TMT Analytics

In the course of FY18 we anticipate 3DP to be able to start ramping its commercial offering to most of the revenue channels we identified, while we expect the company to maintain its agile cost structure.

Consequently, as sales ramp up we anticipate a strong EBITDA margin expansion to more than 60%, typical for Cloud-based service providers employing SaaS and DaaS models.

Sufficiently funded to reach cash break even

3DP's cash position per the end of 2Q17 (December quarter) amounted to A$ 3.7M. Given the company's current low cash burn (A$ 177k in Q1 and A$ 371k in Q2) and limited projected growth of staff numbers and other costs in the next few quarters, we believe 3DP is sufficiently funded to reach cash break even in the current business plan.

Valuation

In order to value 3DP's shares we used two valuation methods, Discounted Cash Flow (DCF) and a peer group valuation.

Discounted Cashflow indicates value of A$ 0.10 per share

Using a long interest rate of 2.5%, long term growth of 3%, a marginal tax rate of 30%, a cost of debt of 5% and a leveraged beta of 1.2, the theoretical WACC for 3DP amounts to 9.4%. However, we believe this substantially underestimates the risks associated with small cap stocks and early stage companies in particular.

In our view, a required rate of return of 15% more accurately reflects these investment risks, which translates into a fair value for 3DP of A$ 0.10 per share.

FIGURE 10: DISCOUNTED CASH FLOW VALUE PER FULLY DILUTED SHARE USING VARYING WACC'S

9.1%	0.19
10%	0.17
11%	0.15
12%	0.13
13%	0.12
14%	0.11
15%	**0.10**
16%	0.09

Source: TMT Analytics

Peer group valuation to comprise of DaaS and SaaS companies

Companies such as Nearmap (ASX:NEA) and Spookfish (ASX:SFI) may seem obvious candidates to include in a peer group for 3DP. However, even though the three companies service the same sectors, unlike NEA and SFI, 3DP does not actually capture geospatial data.

Therefore, we would argue that 3DP's peer group should also comprise of companies that have more resemblance to 3DP's highly scalable, Cloud-based Data-as-a-Service model. Furthermore, given the similarities in business models, we would include Software-as-a-Service companies in this peer group as well.

Examples of such companies listed on the ASX include DropSuite (ASX:DSE), 9Spokes (ASX:9SP), Buddy (ASX:BUD) and MediBio (ASX:MEB). However, due to limited or non-existent research on these companies, reliable financial comparables are not available, which is also the case for SFI.

Casting the net a bit wider to include larger and/or international DaaS and SaaS companies yields companies, such as Integrated Research (ASX:IRI), Tableau (NYSE:DATA) and Splunk (NASDAQ:SPLK). Furthermore, we believe Xero (NZSE:XRO) and MYOB (ASX:MYO) operate business models that are very similar to 3DP's, just with different types of hosted data.

We have also added several listed Geospatial Analytics industry players and potential 3DP channel partners, such as AutoDesk (NASDAQ:ADSK), Trimble (NASDAQ:TRMB) and Hexagon (OM:HEXA B), to round out the peer group in Figure 11.

FIGURE 11: PEER GROUP VALUATION

Company	Code	EV/Revenues			EV/EBITDA		
		FY17	FY18	FY19	FY17	FY18	FY19
Nearmap	NEA	5.1	3.8	2.9	35.4	18.7	10.3
Tableau Software	DATA	3.4	3.2	2.9	40.8	43.0	31.0
Splunk	SPLK	7.0	5.5	4.3		44.7	34.0
Integrated Research	IRI	4.9	4.1	3.6	12.3	10.2	8.8
AutoDesk	ADSK	9.3	8.2	6.5		80.4	27.0
MYOB	MYO	6.1	5.9	5.4	13.9	12.5	11.6
XERO	XRO	8.6	6.2	4.6		489.2	46.6
Hexagon	HEXA B	4.5	4.2	3.9	14.6	13.2	12.1
Trimble	TRMB	3.4	3.2	3.0	17.3	14.9	13.4
		5.8	4.9	4.1	22.4	80.8	21.6
Pointerra	**3DP**	N/M	3.6	1.4	N/M	N/M	3.6

Source: TMT Analytics, S&P Capital IQ

Clearly, looking at EV/Revenues and EV/EBITDA multiples, especially for FY19, i.e. once the company has started to generate meaningful revenues, 3DP is valued well below its peer group on our estimates. While there is obviously quite some uncertainty around 3DP achieving these estimates, we would also argue that the company will be growing substantially faster than its peers when revenues start to ramp up. In our view, the early signs are very encouraging in this respect. This higher growth could arguable warrant substantially higher valuation multiples compared to the peer group.

Looking out 12 months, we believe 3DP has the potential to trade up to and potentially above the peer group average multiples for FY19. On the basis of EV/Revenues this would imply a share price of A$ 0.08.

Conclusion: Price target of A$ 0.08 and Buy recommendation

Given the upside potential for 3DP in our valuation models, we start our research coverage of 3DP with a Buy recommendation and a price target of A$ 0.08 per share.

Near term share price catalysts / Key Performance Indicators

- New surveyor customers signing up to Pointerra.

- Conversion of current trial licenses into fully paid licenses.

- Initial revenues from Pointerra integrations into third party software suites.

- Initial revenues through channel partners.

SWOT Analysis

Strengths

- Fully developed Data-as-a-Service solution for the Geospatial Analytics sector, ready to be commercially deployed.

- The Pointerra platform is vendor agnostic, implying large addressable markets.

- There is a clear efficiency incentive for industry players to integrate Pointerra into their products and workflows.

- The company's very low cost base and highly scalable business model should result in very strong EBITDA margin upside, i.e. higher than 60% in the long term.

Weaknesses

- To a large extent commercial success depends on successful partnerships with industry incumbents, implying some vulnerability on the part of 3DP to deteriorating partner relationships.

- 3DP may not yet have the financial solidity and track record required by some potential partners.

Opportunities

- There is ten years' worth of legacy 3D data sets still stored locally and in a fragmented manner.

- On top of the 19% annual average growth of 3DP's addressable market, the legacy 3D data not yet hosted and managed in the Cloud, will provide further, lateral, revenue upside for the company.

- Depending on how fast the adoption of Pointerra in the Geospatial Analytics market progresses, there is a clear opportunity for Pointerra to become the industry's de facto standard for 3D data hosting and management in the Cloud.

Threats

- Large incumbents may at some point decide to develop proprietary 3D data Cloud hosting and management software of their own.

- While 3DP has two patents pending, the company may not have the means to legally enforce these patents in case of infringements.

Appendices

Board of Directors

Rob Newman (Non-Executive Chairman): Mr. Newman has established a unique track record as a successful high technology entrepreneur in both Australia and Silicon Valley. He was inventor and co-founder of QPSX Communications, which achieved an international standard and sold products world-wide. Mr. Newman was also the founding CEO of Atmosphere Networks, establishing the company with US venture capital backing and ran the business until it was acquired by a US listed company. These businesses combined have established market values of over A$ 200M. Mr. Newman is co-founder and executive director of Stone Ridge Ventures, a technology venture capital firm. His focus is on identifying disruptive technologies with global potential. He is also an active director on a number of high technology companies including being the initial chairman of Nearmap Pty Ltd when privately owned and is currently CEO and Managing Director of the listed entity.

Graham Griffiths (Non-Executive Director): Mr. Griffiths is an experienced Information and Communications technology executive including 22 years at the multinational level with computer vendor NCR Corporation and telecommunications provider AT&T (US and Asia based), in various senior sales, marketing and R&D positions. He subsequently was managing director for 11.5 years of ASX listed technology commercialisation company Ipernica ltd, including leading the IPO. Mr. Griffiths was also responsible for the acquisition of Nearmap (a global leader in the provision of geospatial map technology) into Ipernica in 2008 and supported the early stage of commercialisation and launch of Nearmap. Graham's involvement in the geospatial industry commenced in 2006 as a non-executive director for both NGIS Australia, a provider of location-based information and technology solutions, and Indji Systems, which develops a range of world leading geospatial products that empower businesses through location based technologies. Mr. Griffiths is also a director and angel investor supporting a number of early stage technology companies scale their businesses globally.

Ian Olson (Managing Director): Mr. Olson is a Chartered Accountant and professional public company director with a 25-year career in finance and the capital markets and has helped numerous companies move from private to public status via the ASX. Until recently, Mr. Olson was the owner of WKC Spatial, a geospatial business that specialized in the capture, processing, modelling and management of 3D point cloud data. He started his career with Ernst & Young and has worked in London and New York with global investment banks. He is also the Non-Executive Chairman of Gage Roads Brewing Co Ltd.

Neville Bassett (Non-Executive Director): Mr. Bassett is a Chartered Accountant operating his own corporate consulting business, specializing in the area of corporate, financial and management advisory services. He consults to a number of publicly listed companies and private company groups across a range of industry sectors, is a director or company secretary of a number of public and private companies and has a wealth of experience in matters pertaining to the Corporations Act, ASX listing requirements, corporate taxation and finance. During the past three years Mr. Bassett has held the following ASX listed company directorships; Vector Resources Ltd, Ram Resources Ltd, Meteoric Resources Ltd, Mamba Minerals Ltd and Exoma Energy Ltd. He is principal director of Westar Capital Limited, the holder of an Australian Financial Services License and is a Fellow of The Institute of Chartered Accountants in Australia. He is also State Chairman and former National Director of a major not-for-profit organisation and a committee member of another community based organisation.

Technology and patents

3DP has filed two patent applications, which are pending: Method and System for Computer Graphics Rendering (Patent application number PCT/AU2016/050357) and Method and System for Storing and Retrieving Multi-Dimensional Data (AusPat application number 2016903463). The two technologies combined result in 3DP's fast and efficient method to serve up very large 3D data files on users' web browsers.

The first patent application centers around a smarter and faster way to render resource-consuming 3D data images on computer screens, tablets and mobile phones, such that even thin clients, such as tablets and Chrome books can display 3D data imagery in a web browser.

The second application is focused on improved data compression and the ability to manipulate 3D data while in compressed form.

3DP's secret sauce: A way of handling and storing 3D data more efficiently

As a starting point, we would advise interested readers to watch this YouTube video on the basics of how spatial data is organized: https://www.youtube.com/watch?v=jxbDYxm-pXg. This video discusses a quadtree for 2D images, but the same principle applies to octrees used for 3D images.

Using octrees and determining which data points are relevant and within view, helps Graphics Processing Units (GPUs) in computers to speed up the rendering process on screen using a process called frustum culling.

Frustum culling to reduce rendering time

A viewing frustum is the field of view of a camera, or, in our context, the part of a 3D image we can see on screen when looking at it from a certain angle. For any given viewing angle, many parts of a point cloud will be out of view, or are too small to be viewed, and do not need to be displayed on screen. Even objects that are in the frame, but are positioned behind another object, do not need to be rendered on screen.

Frustum culling is the process of removing objects that lie out of view (Figure 12) in order to reduce the time it takes a computer to render the image on screen and requires a number of process steps that are computationally intensive using today's methods.

FIGURE 12: A VIEWING FRUSTUM AND FRUSTUM CULLING OF OBJECTS A AND PART OF OBJECT B
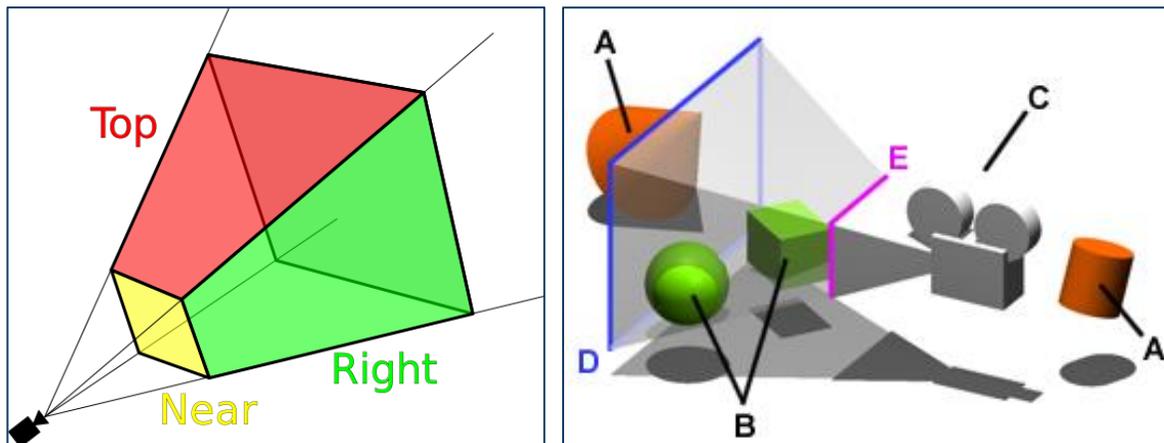
Source: Luxinia, TMT Analytics

When compared to current computer graphics rendering technologies, 3DP's technology as described in its pending patent Computer Graphics Rendering moves the frustum culling process forward in the 3D image generating process on a computer.

I.e. frustum culling is done at a higher level, essentially reducing the amount of data that needs to be transformed to generate the frustum view, which reduces Central Processing Unit (CPU) processing time. In turn, this leads to faster rendering of the image on screen. The entire patent text can be read here:

https://patentscope.wipo.int/search/docservicepdf_pct/id00000035601876/PAMPH/WO2016179659.pdf

The data processing method described in 3DP's patent application has several advantages compared to existing techniques:

1. The technology allows for processing of smaller data packets rather than an entire dataset at once.

2. The entire process can be executed on a computer's CPU rather than its GPU, as is done by current rendering techniques. GPUs have memory restrictions, i.e. memory is slow to access on a GPU, limiting overall processing speeds.

3. Additionally, processing on GPUs doesn't scale up with larger datasets.

4. Finally, Pointerra is Cloud-based as opposed to locally run desktop programs. This means that 3DP can perform parallel processing on AWS' servers implying high delivery speeds of images.

5. The Cloud-based nature of Pointerra also implies it is scalable with larger datasets, e.g. 100BN points instead of 10M or 100M, as Pointerra will automatically add AWS servers to assist with a certain query. So processing 100BN points can be done as fast as processing 10M point, just by increasing the processing capacity in the Cloud. This is not possible with existing 3D analytics and design software.

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