Volpara Health Technologies Ltd

Equipped for success

Volpara Health Technologies (VHT) is a leading healthcare software developer with a focus on breast imaging. The company's flagship product, 'VolparaEnterprise' offers a unique solution to a growing regulatory burden while helping to deliver high quality patient outcomes, and limit expensive retakes. Meanwhile its foundation product, 'VolparaDensity' is the standard bearer in the automatic assessment of breast density, a factor which has been shown to elevate the risk of developing breast cancer by up to 6x while causing a higher risk of misdiagnosis. The company is in the early stages of a US rollout, obtaining 3.7% market penetration by 1Q19 (March YE) and guiding to 9% by the end of FY19. Its subscription revenue model provides for a high level of recurring revenue with the company expected to reach profitability during CY20. VHT's status as a thought leader positions the company perfectly to rapidly gain market share, causing us to initiate with a Buy recommendation a price target of $0.91.

US regulatory burden opens door for disruption

- The US breast imaging industry is governed by a specific piece of legislation (MQSA) which requires each accredited facility to submit to an annual audit of images via a specific program (EQUIP), with issues pertaining to image quality critically assessed. The *VolparaEnterprise* product specifically addresses the underlying causes of poor image quality while providing an accessible way to retrieve appropriate images for submission. Investment in the software delivers clear ROI's for the industry and significantly reduces compliance related administration.

Large and growing market lays out long runway

- There were 39.2m mammograms performed in the US in the past year indicating a near term addressable market of ~$US80m on existing prices. Price increases are expected to be driven by the near term development of compelling new modules however while Siemens put the number of women worldwide who qualify for breast screening at 250m, unveiling a long term TAM of >$750m. The company is well placed to capture a meaningful piece of this market, starting with the 9% target in FY19 and followed by further expansion globally in later years.

Key Financials

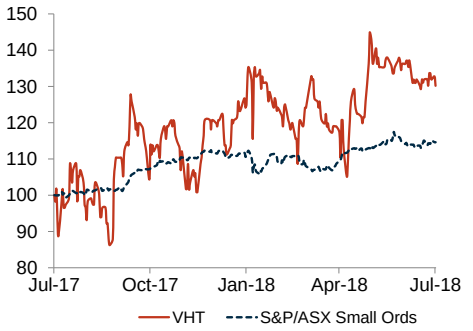
Year-end March (NZ$)	FY17A	FY18A	FY19E	FY20E	FY21E
Revenue ($m)	2.0	3.5	6.6	17.2	31.2
EBITDA ($m)	(9.8)	(8.8)	(10.8)	(2.7)	9.2
EBIT ($m)	(9.8)	(9.1)	(11.1)	(3.0)	8.9
Reported NPAT ($m)	(9.6)	(8.8)	(11.0)	(2.9)	9.1
Reported EPS (c)	(31.8)	(6.0)	(7.4)	(1.6)	5.0
Normalised NPAT ($m)	(9.6)	(8.8)	(11.0)	(2.9)	9.1
Normalised EPS (c)	(31.8)	(6.0)	(7.4)	(1.6)	5.0
Dividend (c)	0.0	0.0	0.0	0.0	0.0
Net Yield (%)	0.0	0.0	0.0	0.0	0.0
Franking (%)	-	-	-	-	-
EV/EBITDA (X)	-	-	-	-	14.3
Normalised P/E (x)	-	-	-	-	16.5
Normalised ROE (%)	69.7	-	-	-	93.0

Source: OML, Iress, Volpara Health Technologies Ltd

Last Price
A$0.76
Target Price
A$0.91
Recommendation
Buy
Risk
Higher

Health Care Technology	
ASX Code	VHT
52 Week Range (A$)	0.50 - 0.84
Market Cap ($m)	135.0
Shares Outstanding (m)	178.8
Av Daily Turnover ($m)	0.2
3 Month Total Return (%)	11.0
12 Month Total Return (%)	30.2
Benchmark 12 Month Return (%)	14.6
NTA FY19E (¢ per share)	6.7
Net Cash FY19E (NZ$m)	13.7

Relative Price Performance



Source: FactSet

Consensus Earnings

	FY19E	FY20E
NPAT (C) ($m)	(7.9)	4.3
NPAT (OM) ($m)	(11.0)	(2.9)
EPS (C) (c)	(4.4)	2.4
EPS (OM) (c)	(7.4)	(1.6)

Source: OML, Iress, Volpara Health Technologies Ltd

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Executive Summary

Volpara Health Technologies Ltd (VHT) is a market leading developer of Enterprise imaging software, targeting the early detection of breast cancer. The flagship product is *VolparaEnterprise* which is the only product that automatically collects and analyses the key determinants of image quality, levels of breast density and dose in breast imaging.

VHT is in the early stages of a US rollout out, where the FDA regulates the industry via a rigorous accreditation program specifically targeting the issues *VolparaEnterprise* addresses. The value of the product has seen VHT grow market share to 3.7% in a short space of time, while the company has guided to 9% by the end of FY19. VHT's success will be achieved by leveraging its expertise as a global thought leader in breast imaging, attained by its work in breast density, for which it has developed its product, *VolparaDensity*.

Breast imaging is a key tool for the early diagnosis of cancer, and VHT is well positioned to capture a material share of an estimated global TAM of >US$750m.

We initiate with a Buy recommendation and a price target of $A0.91.

Investment Drivers

Breast screening to remain critical for the early diagnosis of breast cancer

Breast cancer is the most common cancer diagnosed in women around the world, accounting for more than 25% of total cases. Approximately 1 in 8 women will be diagnosed with breast cancer at some stage in their lives with that rate increasing with age. While inherited genes have been identified as a risk factor, currently 85% of cases occur in women with no family history, with gene mutations occurring as a part of the natural aging process the primary factor. Approximately 80% of cases occur in women over the age of 50, while the World Cancer Research Fund has indicated that breast cancer risk doubles each decade until Menopause.

In more advanced societies, mortality rates have been declining. In fact, in Australia the 5yr survival rate has increased from 72% in 1982-87, to greater than 90% today. Similar improvements have been demonstrated in the other countries around the world. This has largely been attributed to improving technology and increasing awareness of the benefits of early detection. According to CDC data mammogram participation rates in the US in 1987 were just 29%, improving to 64% in 2015.

Breast screening has become a critical diagnostic tool for the early diagnosis of breast cancer, and we expect it to remain so as global populations continue to age.

Growing awareness of density as a risk factor

Research has demonstrated that women with dense breasts are up to 6x more likely to contract cancer than those with mostly fatty breasts. Additionally, breast screening will on average miss more than 50% of cancers present in women with high levels of breast density. Despite this, most women are unaware of the increased risk, let alone their own density.

This has driven a number of states (34) in the US to legislate the need to inform patients of their breast density, with the American College of Radiologists developing a scale (BI-RADS) to effectively categorise the levels. A push is also underway to federalise this requirement, while in New York legislation exists that requires insurers to cover ancillary services for those women deemed to be higher density. Assessment of breast density has traditionally been the responsibility of the relevant radiologist however, with categorisation highly subjective and inconsistent.

VolparaDenstiy, VHT's foundation product, specifically addresses this issue by automatically assessing images and instantly delivering a BI-RADS consistent score. VHT founder Dr Highnam was a pioneer of this notion, with the software widely cited

as the global leader in the space. It has underpinned brand awareness, driving use in 36 countries and establishing VHT as a thought leader across the breast imaging industry.

Increased compliance burden via the MQSA and EQUIP

In the US, breast cancer screening is governed by the *Mammography Quality Standards Act (MQSA).* The act empowers the FDA to oversee breast imaging facilities to ensure there is consistency and quality in imaging, in order to reduce the risk of misdiagnosis.

In 2016 the FDA sought to bolster the regulations to focus on specific determining factors of image quality via the *Enhancing Quality Using the Inspection Program (EQUIP).* Inspections commenced in 2017 however the FDA allowed a grace period with citations only starting to be issued at the beginning of 2018. In the first year (2017), 43% of the 8,486 inspections had one or more EQUIP deficiencies. With citations now being issued, facilities are seeking means to systematically deal with the image quality issue, while at the same time meeting the requirements stipulated by the FDA.

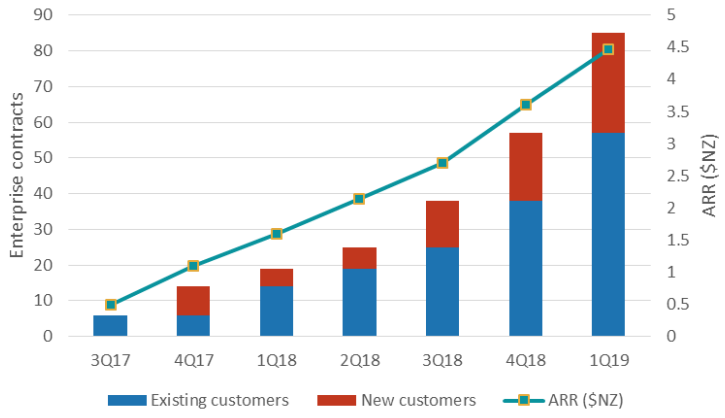
VolparaEnterprise is VHT"s flagship software which directly and uniquely addresses this need. The platform automatically assesses the key components driving image quality, while also providing for automatic storing and retrieval of images for the purposes of inspection in addition to aforementioned density scores. There is currently no other platform offering the same solution in the US market or abroad. VHT's reputation as a leader in breast imaging, built on the foundations created from *VolparaDensity*, positions the company perfectly for rapid uptake.

First mover advantage/competitive position

Because of this utility, uniqueness and first mover advantage, VHT has seen penetration in to the US breast cancer screening market grow from 0.7% or 294k patients screened in FY17, to 3.3% or 1.3m screened by the end of FY18 and 3.7% in 1Q19. The company has now flagged an expected penetration of 9% by the end of FY19, while the product is either sold or they are in active sales discussions with 20% of the market.

Since release of *VolparaEnterprise* on a subscription basis, sales have been exhibiting strong momentum, with the number of contracts signed accelerating on a quarterly basis.

Figure 1: Quarterly sales profile



Source: OML, VHT

This is strong validation of the decision to shift to a SaaS revenue model, with revenue based on a price per screening (~$US2-$US3). We expect this trend to continue, with the current sales trajectory taking the company to breakeven in CY20.

Subscription model to facilitate price increases

Average ARR per patient is currently US$1.97, however more recent contracts have been signed at higher prices (1Q19 average: $3.00). This reflects enhanced functionality and increased demand, which offers a glimpse of the future opportunity for VHT. There remains considerable scope to continue growing prices by adding modules to the enterprise platform, progressively moving to become a vendor neutral, holistic solution for the management of diagnostic imaging practices.

VolparaEnterpriseLive! is a near term product release, with the platform already exhibted at industry conventions in late 2017. The product provides instant feedback on image quality and clincal issues, delivering better patient outcomes and avoiding costly retakes. This highlights clear, identifiable ROI's for clinics.

Computer aided detection (CAD) is another possible future development, with the practice now widespread across the US market (~75% penetration). Professor Nico Karssemeijer, a VHT founder and major shareholder, was a pioneer in CAD with the development of industry leading *ImageChecker.* Automatic risk scores are a further application, with *VolparaDensity* already being used in key studies around the world.

As sales continue to scale, VHT will gather powerful data which will help lead development opportunities as more energy is directed towards breast cancer detection.

Inclusion in national screening program to expand global sales

The UK has one of the best national screening programs in the world, with all women between the ages of 50 and 70 offered a free scan every 3 years. In 2017 2.2m participated in the program. Leveraging that program, since 2009 there has been a study conducted which seeks to gather relevant lifestyle and physiological factors in order to efficiently and accurately devise a breast cancer risk score. This study has recently been expanded to better understand how the risk scores can be provided to patients (PROCAS II). VHT has been exclusively selected as the breast density provider to the study.

This obviously opens up the opportunity to process 2.2m women p.a. (1.7x FY18 volume), but perhaps more critically it positions the company as the leader in automatic breast density measurement. As attention continues to grow regarding density as a risk factor globally, VHT are extremely well placed to lead uptake of relevant software and expand their market share abroad.

Expanding addressable market via global sales and price increases

In the past year, there were 39.2m mammograms performed in the US, indicating a near term addressable market of ~US$80m at the current average price per patient. Given our expectation for price increases (new client wins at $US6.00/woman), driven by expanding functionality, we view US$250m as a more realistic long term estimate for the US.

Meanwhile in the UK there are 12.9m women over the age of 50, the recommended age to commence screening. Applying the same methodology to our US market, we estimate the long term addressable market for the UK is ~$US35m.

Breast screening isn't unique to just a few markets however, with federalised breast screening programs in place in 26 countries around the world. Furthermore, countries like India and China, with large populations, are comparatively underdeveloped but have a rapidly emerging middle class who are demanding a higher standard of healthcare. Siemens, a leader in diagnostic imaging equipment, have estimated there are approximately 250m worldwide who qualify for breast cancer screening, putting a the long term TAM at >US$750m.

Key risks

VHT is not yet profitable

VHT is an early stage technology company who have recently changed their revenue and pricing models. They are also in the middle of an investment phase, with ongoing product development in addition to an expansion of the sales team. This means we do not expect the company to reach breakeven until CY20.

Failure to capture anticipated market share

While the company has demonstrated impressive momentum thus far in capturing 3.7% of the US market, this is not an indication of future success. Lead times are long, while competition for budget dollars within healthcare business is high. We nevertheless believe this risk is mitigated by the lack of meaningful competition and value VHT software offers the industry.

Inability to enact price increases

We forecast annual price increases from FY18 onwards, supported by new product development. Achievement of price increases partly underpins the company's ability to reach breakeven in CY20, while failure will potentially push out expectations.

New competition

VHT currently enjoy a lack of meaningful competition, with no other company delivering an MQSA aligned enterprise solution or industry backed, vendor neutral density product. The large addressable market and favourable industry conditions could encourage new entrants however, which could undermine the company's ability to achieve its targets.

Regulatory changes

VHT is currently benefiting from highly favourable industry dynamics, with the MQSA EQUIP and growing awareness of breast density as a risk factor creating a fertile sales environment. Changes to the legislation or any negative shifts in the opinion of breast screening as a valuable diagnostic tool could impacts on VHT's business.

Currency

VHT currently earns majority of its revenue from overseas markets, with the bulk earned in USD. Shift in currency markets over time could have a translation impact for VHT, for which they are currently unhedged.

Valuation

We value VHT using a 10yr Discounted Cash Flow (DCF) method in order to account for long term profit growth. Using a waac of 13.4% and a terminal growth rate of 3.5%, we arrive at price target of $0.91, implying an FY20 EV/Sales of 8.7x.

Figure 21: DCF inputs

Key DCF inputs		Key DCF outputs	
Risk free rate	5.0%	Explicit cash flows	62
Equity risk premia	6.0%	Terminal item	88
Beta	1.40	**Enterprise value**	**149**
Cost of Equity	13.4%	Less net debt (add cash)	-9
Cost of Debt - After tax	5.3%	**Equity value**	**158**
D/EV	0.0%	Diluted share count	183
WACC	**13.4%**	**Equity valuation p.s. ($NZ)**	**0.87**
Terminal growth	3.5%		
		Roll forward at ke	0.99
		Equity valuation p.s. ($A)	**0.91**

Source: OML

We view our long term forecasts as conservative with the company achieving a long term (FY28) penetration in the US of 30% with no contribution from global sales, while we estimate FY28 ARR/woman of $US4.00 compared to $US1.97 at the end of FY18

Comparison

Our chosen ASX listed, software peer group currently trades on an average FY20 EV/Sales multiple of 7x, with an average FY20 revenue growth rate of 28.6%. We believe VHT deserves to trade at a modest premium to the average given the higher growth, while acknowledging the company will not reach profitability until FY21.

Figure 22: ASX listing software comps

Name	Mkt Cap	FY19 EV/Sales	FY20 EV/Sales	FY19 Sales Growth	FY20 Sales Growth
Wisetech Global Ltd	4584.83	15.82	12.82	32.8%	23.3%
Pro Medicus Ltd	868.30	18.07	15.22	24.3%	18.7%
Class Ltd	258.86	5.90	5.12	16.5%	15.3%
Xero Ltd	5943.96	9.09	7.19	29.1%	26.4%
Technology One Ltd	1564.46	4.51	4.06	9.9%	11.2%
Altium Ltd	2657.81	11.60	9.75	20.0%	18.9%
Pushpay Holdings Ltd	1038.12	4.96	4.28	49.8%	16.0%
Iress Ltd	2001.51	4.35	4.09	6.9%	6.2%
Myob Group Ltd	1859.23	4.62	4.25	8.9%	8.8%
Bravura Solutions Ltd	694.16	2.90	2.70	10.9%	7.5%
Volpara Health Technologies	134.99	18.48	7.34	85.7%	162.2%
Average		**9.12**	**6.98**	**26.8%**	**28.6%**
Median		**5.90**	**5.12**	**20.0%**	**16.0%**

Source: Bberg, OML

We further view Pro Medicus Ltd (PME) as a useful benchmark as an Enterprise imaging software company with sales in to the US healthcare industry, including mammogram facilities. PME is trading on an FY20 EV/Sales multiple of 15.2x, while growing revenue at ~20%.

Company Overview

Volpara Health Technologies (VHT) is a diagnostic imaging technology company, with a focus on early breast cancer detection and clinic management. This is achieved primarily via the use of VHT's patented platforms *VolparaDenstiy, VolparaDDP* and *VolparaEnterprise*.

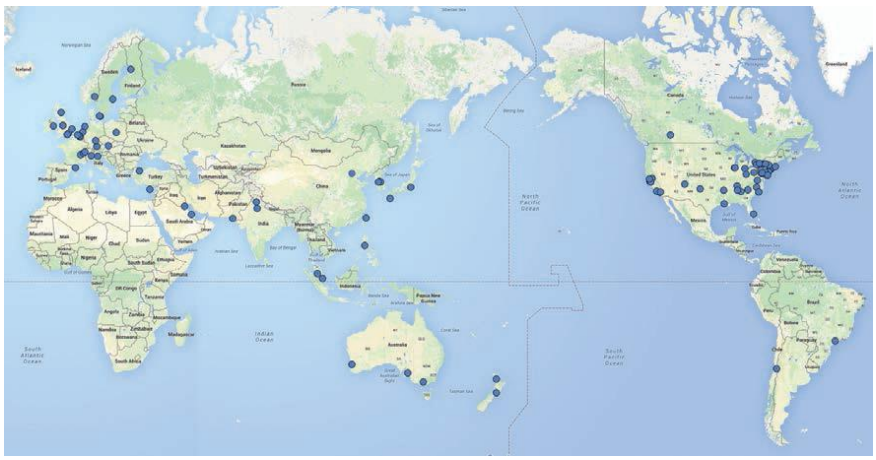
The company is in the early stages of a US focused commercial roll-out with 3.7% market penetration as at the end of 1Q19. The US market holds several compelling characteristics, including population size and a culture of innovation, however perhaps most compelling is government legislation requiring greater disclosure and better service levels for breast imaging, as a means to address high rates of breast cancer. VHT is currently the only company with products specifically addressing these requirements, with other products in the market limited to specific uses or broad in scope.

In addition to the US, VHT also has its products installed in 36 countries around the world with each at varying stages of maturity. In the UK VHT is involved in a key government program that seeks to identify women who are at higher risk of developing breast cancer, with their market leading breast density product positioning them as the global expert. This augurs well for the company's ability to rapidly gain market share in the UK, US and around the world.

VHT is further seeking to expand the offering to other areas of breast imaging, and eventually, other modalities. In doing so the company will be able to expand the addressable market while increasing the average fee charged per clinic.

VHT has achieved its position as a thought leader across breast imaging technology through its citation in 273 science publications and 34 granted patents, with a further 22 in various stages of application and acceptance. The founder of VHT, Dr Ralph Highnam, has also dedicated his life to assessing and analysing breast density, with the subject matter the focus of his work conducted during his time at Oxford University during 1992

Figure 4: Volpara installations



Source: VHT

History

VHT was founded by current CEO Dr Ralph Highnam along with prominent scientists Professor Sir John Michael Brady, Professor Nico Karssemeijer and Professor Martin Yaffe. Dr Hignam completed his PhD on the quantification of breast composition via volumetric parameters at Oxford University under the guidance of Professor Brady, with this idea forming the basis of modern Volpara technologies.

Dr Hignam's PhD was completed in 1992, however due to limitations of breast scanning technology at the time, commercialisation was impossible. After the digitisation of mammography started to gain prominence in the early 2000's opportunities for clinical implementation began to take shape.

In 2009 each of the four colleagues met at a trade show in Chicago and from that meeting Volpara was founded under the name Matakina. In 2015 the name was changed to Volpara to better align the business with its key products and since then has grown to 53 staff and a total contract value of NZ$11.2m. The company's flagship product (*VolparaEnterprise)* is now experiencing rapid adoption by US clinics throughout the US.

Figure 5: Timeline

1992	▪ Dr Ralph Highnam completes his PhD thesis on the automatic quantification of breast composition from breast x-rays from Oxford University.
2009	▪ Founders (Highnam, Brady, Karssemeijer, Yaffe) start developing and filing IP for what would become Volpara.
2013	▪ Volpara moved its head office to Wellington, NZ
Apr-16	▪ Volpara listed on the ASX
Jul-16	▪ Volpara launch *VolparaEnterprise*
Oct-16	▪ The FDA launch the EQUIP initiative
Oct-16	▪ Volpara make their first SaaS sale of *VolparaEnterprise*
Mar-18	▪ 3.2% of women screened in the US contracted to Volpara software

Products

VHT are currently marketing 3 separate products, with each representing a natural evolution of the preceding release. They have also been developed in response to changing regulatory requirements, or growing awareness of the risk associated with certain elements of the breast screening process.

VolparaDensity

VolparaDensity was the company's first product, with Dr Highnam's work on automatic volumetric measurement of breast density forming the basis for product development. The need to assess breast density arises from its identification as a key risk factor as well as it's masking feature for the diagnosis of cancer. The product delivers to the technician an objective score at the time of or shortly after assessment. Patients deemed to have high breast density are often required to conduct follow up examinations, and the *VolparaDensity* score can be delivered in a timely fashion ensuring these tests can be performed on the same day. Existing practice requires manual visualisation by physicians, often a day later, meaning inconvenience for the patients and a risk of referral-loss for the facility.

VolparaDDP

Breast density scores are incorporated in to the *VolparaDDP* platform (DDP: "Density, Dose, Pressure"), however the platform has expanded to include other key components. It is essential that dose is kept as low as possible during routine mammography screening, as too high a dose can actually result in a higher risk of breast cancer. Previous measures of dose have been relatively simplistic however, with specific breast composition and/or breast thickness not taken in to account. Because of VHT's density algorithm, *VolparaDDP* assists technicians in delivering a dose that is appropriate for that patient. There is currently no other product currently available providing that level of personalised care.

Assessment of pressure reflects VHT's shift to clinical quality improvement, with levels of pressure often a determining factor on if a patients returns to that facility due to the levels of discomfort. It can also be a determinant of image quality, with too much or too little pressure often adversely affecting image outcomes.

VolparaEnterprise

VolparaEnterprise takes the notion of quality improvement further, incorporating all the features of DDP while also adding analysis of positioning. The platform also provides a means to easily retrieve images for assessments, while isolating key performance metrics. It further offers analysis of operational efficiency, including screening times and referral relationships. These features altogether are highly pertinent in the US particularly, where the FDA require annual submissions by all accredited facilities directly addressing image quality, and remediation procedures. This is examined further in a later section ("The evolution of Volpara").

VolparaEnterpsieLive! is a new iteration of this platform, with analysis of all the aforementioned factors conducted within 30 seconds of image acquisition, meaning the technician has all the information made available while the patient is in the room. The company estimates that between 2% - 4% of all images are deemed deficient enough to require a recall, meaning an inconvenience for the patients and a material cost for the facility. This new feature therefore offers an easily identifiable economic benefit to the facility, in addition to enhanced patient experiences.

All VHT's products are vendor neutral, which is another feature setting them apart from the industry with most competing products sold by equipment manufactures. The software is also available on the cloud (Azure), allowing for rapid onboarding and harvesting of aggregated data. The richness of data that VHT compiles provides for ongoing development possibilities for the business, as evidenced by the recent addition of the *VolparaRisk* module which identifies higher risk patients using variables other than family history.

We expect new product releases to be a regular occurrence over coming years, ensuring the company remains at the forefront of the industry while growing revenue per contract.

Intellectual Property

VolparaDensity is considered in most jurisdictions to be a medical device as it measures and analyses specific patient information, meaning it needs to achieve FDA clearance (510(k)). VHT has satisfied this requirement, as well as clearing hurdles for most other global regulatory bodies (TGA, CE etc). VHT is further protected by 34 granted patents.

VHT's moat largely rests in the expertise underlying the products; expertise that has been supported by citation in over 273 science publications. These studies have widely lauded *VolparaDensity* as the most reliable and consistent automatic breast

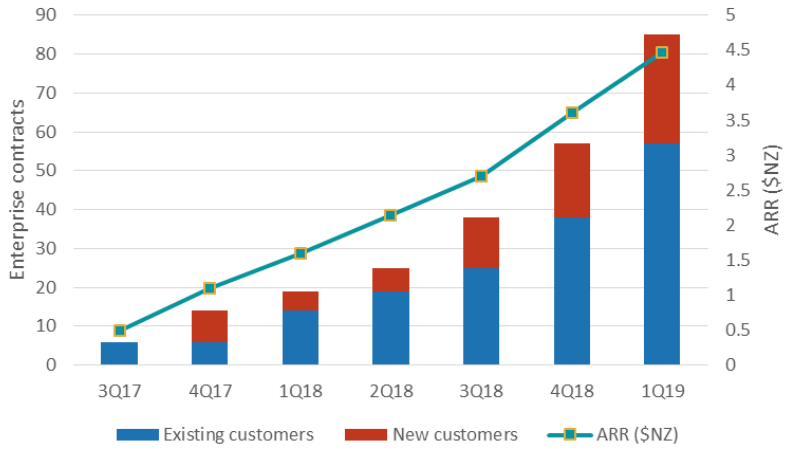
density platform available. Furthermore, *VolparaDenstiy* is the only automatic density product accepted for use in the industry leading Tyrer-Cuzick breast cancer risk prediction model.

Contract, pricing and subscription

At IPO, VHT products were sold on a licence basis. This was on the basis of an upfront payment of $US30k to $US150k, depending on the size of the facility, in addition to 15% of the upfront payment for ongoing services. In July 2016 (2Q17) the company shifted to a subscription revenue model alongside the cloud based *VolparaEnterprise* platform.

Early returns were positive, albeit supported by heavy discounting to grow brand awareness. More recent quarters have demonstrated a highly encouraging sales performance, with sales in each quarter accelerating since the beginning of FY18.

Figure 6: Quarterly sales profile



Source: OML, VHT

Subscriptions are charged on a per screening basis, with existing contracts ranging from ~US$2 to $US3.5 per woman. Contracts are typically signed for 5 years, with yearly renewals while payment is calculated on estimated volume and paid in advance. Any scans performed that are in excess of estimates are subject to an additional payment.

Transition to a subscription revenue model, as well as its presence on the cloud, allows for an ongoing relationship with the client and scope to grow revenue per woman via the addition of new modules. *VolparaEnterpriseLive!* is one such example, and we would expect to see ARR grow consistently over time.

The evolution of Volpara

While *VolparaEnterprise* is the company's flagship product *VolparaDensity* was responsible for building VHT's brand awareness, with the founders early thought leaders in the importance of density measurement.

Breast Density

The American College of Radiology (ACR) has categorised women's breast density according to four separate classifications beginning from 'fatty' to 'extremely dense'. This is relevant as research has shown density to be a key risk factor for the development and identification of breast cancer. In fact, it has been revealed that women with dense breasts are up to 6x more likely to contract cancer. Furthermore, mammograms will on average miss more than 50% of cancers present in women with high levels of breast density.

Assessment of breast density has traditionally been by eye, with grading determined by the assessing radiologists own perspective. The categories are stipulated as:

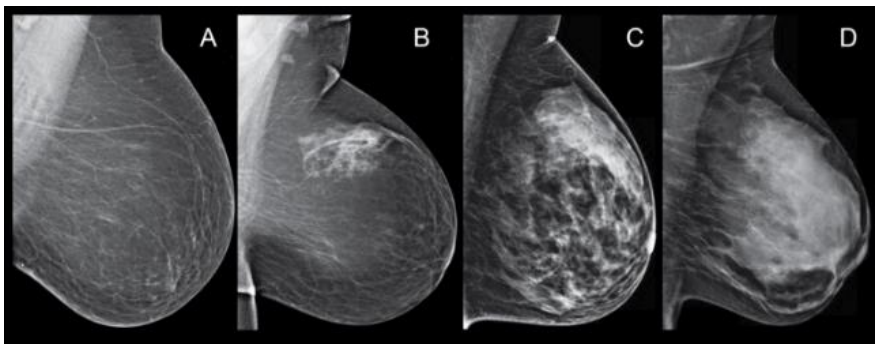
A. The breasts are almost entirely fatty

B. There are scattered areas of fibroglandular density

C. The breasts are heterogeneously dense, which may obscure small masses; and;

D. The breasts are extremely dense, which lowers the sensitivity of mammography.

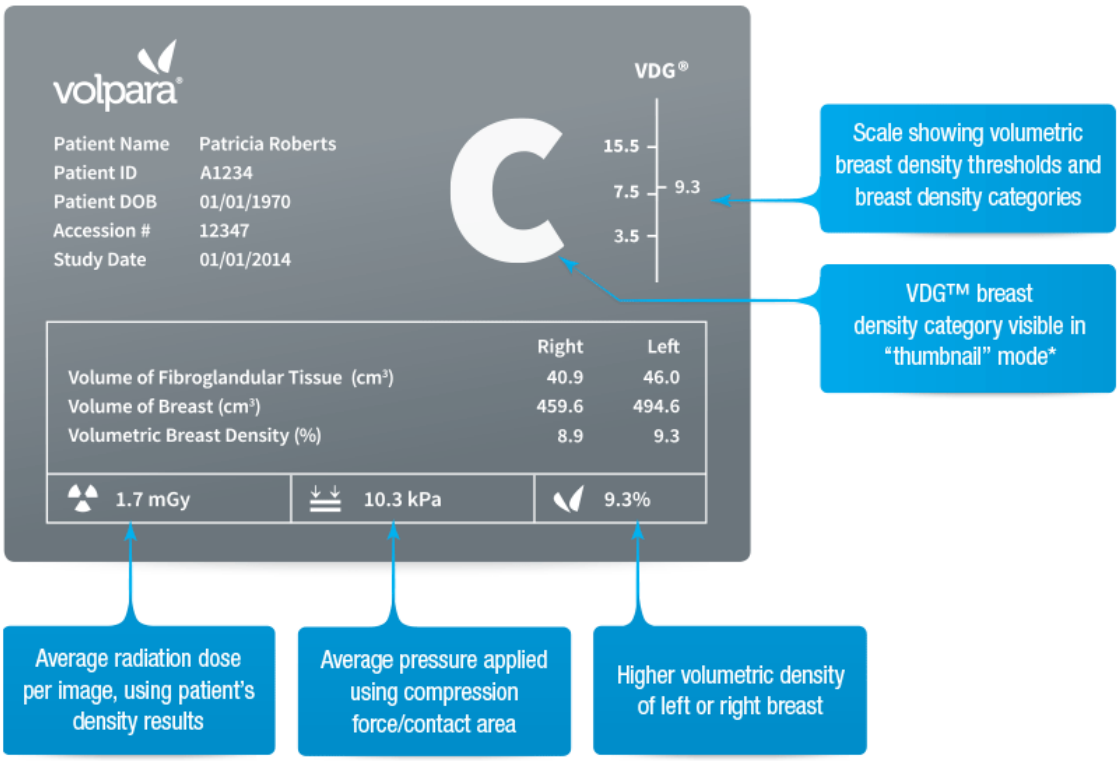
Figure 7: Breast density categories



Source: densebreast-info.org

Clearly the level of subjectivity historically applied to the process is an imperfect solution, paving the way to miscommunication with the patient and relevant stakeholders. VHT CEO Dr Ralph Highnam recognised this fact and developed *VolparaDensity* as a means to address the issue, offering a computer driven measurement, aligned with prevailing industry categorisation, which can be delivered to patients immediately.

Figure 8: *VolparaDensity* scorecard



Source: VHT

The instant delivery of information has value to both the doctor and the patients. Previously images would be have to be assessed by the radiologist who would produce a report with their findings, which is then delivered to the patient in several days time. At that point, those patients who were informed of a higher breast density, would be referred for further tests (ultrasound, biopsy etc) on another day. Clearly this is inefficient for both the clinic and the patient.

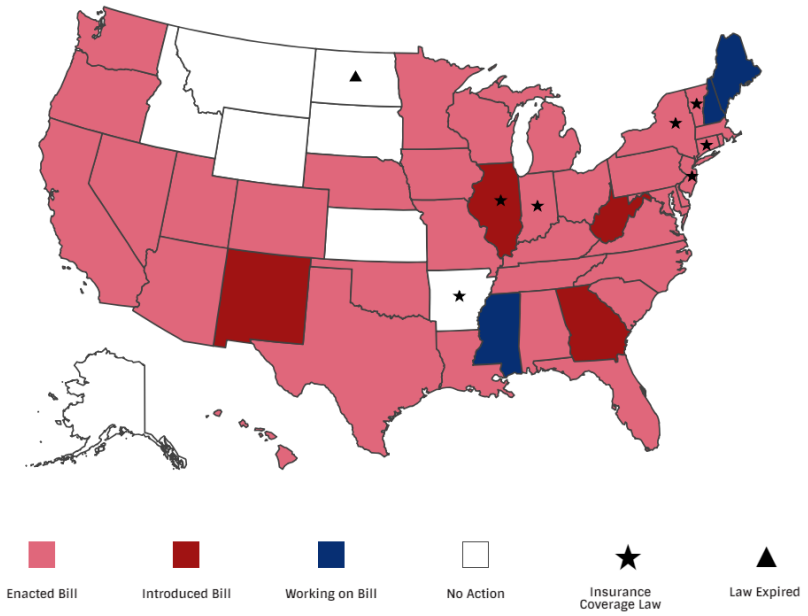
With the delivery of an immediate assessment, patients can have further tests conducted on the same day, saving time for all involved and ensuring the test is conducted at that clinic.

Awareness of breast density as a risk factor

While it is now known that women with dense breasts are 6x more likely to contract cancer and are at greater risk of a misdiagnosis, awareness of it as a key risk factor among women is still relatively limited. This is progressively changing however.

In 2009, Connecticut became the first US State to legislate the requirement to report breast density following a mammogram, with more States progressively doing the same over time. By the end of 2014 17 States had enacted legislation, by the end of April 2018 that number has grown to 35 with a further 4 currently considering an introduced Bill.

Figure 9: State legislation map



Source: areyoudenseadvocacy.org

In the US specifically there is now an effort to establish a national standard, with the US Congress and Senate currently considering the Breast Density and Mammography Report Act. This Bill would nationally mandate that all patients and referring health providers are made aware of their breast density.

Some of have questioned the value of informing patients of their risk due to the influence it would have on their decision to undertake additional screening. This is largely due to the absence of coverage for breast ultrasounds with most insurance companies. This has served to create further debate however, with pressure on insurance companies emerging to cover breast ultrasounds for those identified as higher risk. An objective, industry backed density score is critical in progressing this issue, as insurers seek an objective risk based measure to support claims, ensuring take up of automatic assessment tools will continue for the foreseeable future.

VHT's market leading density product has been adopted in 36 countries, with the above reasons ensuring there remains considerable runway for further growth. The environment around breast imaging has continued to evolve however, presenting new opportunities for an expanded product suite. Devising breast cancer risk scores is one such application, with breast density included alongside lifestyle and physiological factors. *VolparaDenstiy* is the standard bearer for use within this application, having recently been selected as the sole provider to a UK national breast screening program study, as well as being included in the Tyrer-Cuzick risk model, which is widely considered the most comprehensive model available.

More holistic applications such as enterprise solutions are also increasingly being sort after due to shifting regulatory requirements.

The Mammography Quality Standards Act (MQSA)

Mammography has been used as a means to detect early stage breast cancer since the mid 1960's, in its first few decades of application however images suffered from wide variations in quality. The US congress responded by enacting the Mammography Quality Standards Act of 1992 (MQSA).

The MQSA was designed to ensure practicing facilities adhered to uniform standards that would consistently provide for high quality images. Compliance is partly enforced

by an accreditation system, whereby each facility is accredited by an FDA approved organisation while each also needs to hold an active MQSA certificate in order to legally practice. Failure to comply with the Act could see accreditation removed.

In recent years however, inspections have often failed to address specific image quality considerations. In response to this, the FDA have launched the *Enhancing Quality Using the Inspection Program (EQUIP).*

The program doesn't change any part of the MQSA, instead it refocuses annual inspections upon three key components. The first of those relates to the following specific clinical image attributes:

i. Positioning
ii. Compression
iii. Exposure level
iv. Contrast
v. Sharpness
vi. Noise
vii. Artefacts
viii. Identification

The second component relates to corrective measures taken in response to poor image quality, including mechanisms for providing ongoing feedback to interpreting physicians. The third component pertains to supervision and record keeping of these testing and necessary corrective measures.

These renewed inspections begun on the 1st of January 2017, however no citations were recorded during the year while facilities adjusted to the requirements. 43% of facilities were identified as being deficient in one or more areas however, demonstrating an industry fundamentally ill prepared to meet its compliance obligations. With the program going fully live on the 1st of January 2018, this year represents a tipping point where facilities establish processes to satisfy FDA requirements, or potentially face damaging penalties.

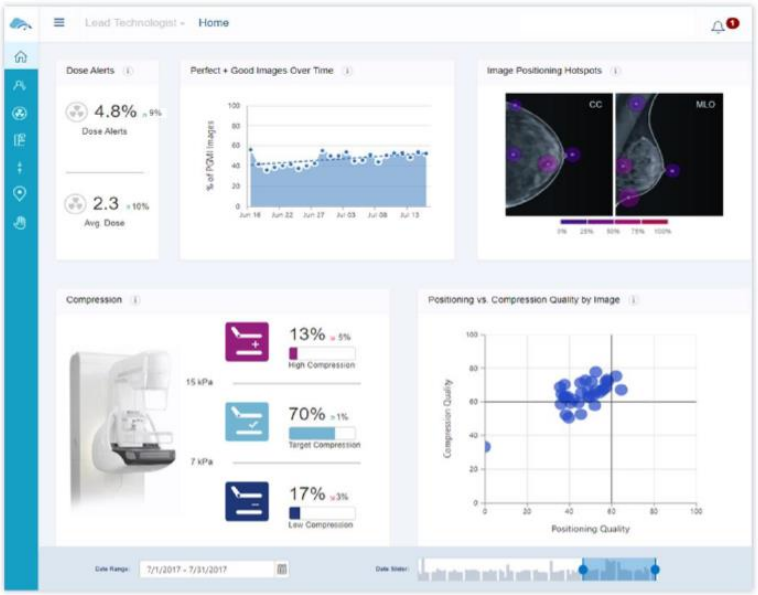
VolparaEnterprise

Recognising the increasing cost and complexity of complying with the MQSA, VHT developed *VolparaEnterprise* which specifically addresses the issues underlying image quality.

The platform **uniquely** analyses positioning, compression and dose during the examination, while also allowing for easy retrieval of information directly relating to past examination. This provides for genuine efficiency gains within facilities, ensures less burdensome compliance with the MQSA and ultimately, higher quality patient outcomes.

Dose is an equally important measure as a standalone assessment, as too high a dose can elevate the risk of developing cancer. Currently there are no products available that measure dose on an patient appropriate basis, other than VHT products.

Figure 10: *Volpara Enterprise* Dashboard



Source: VHT

Furthermore, VHT is currently **the only platform in the US delivering each of these items on a vendor-neutral basis**, meaning they can be utilised across machines regardless of the manufacturer. It is a compelling first mover advantage in a market that is increasingly asking for greater visibility and reliability in image quality.

Clinics are also required to prepare for annual inspections which are directly focussed on image quality. *VolparaEnterprise* efficiently aggregates the information collected for each scan and arranges the information in a way which is readily accessible.

Quality patient outcomes have become a new area of focus for the US healthcare industry as a whole in recent years with the Medicare Access and CHIP Reauthorisation Act (MACRA) and the Merit-Based Incentive Payment System (MIPS) a demonstration of that. MIPS changes the way government funding is adjusted to physicians according to performance. This is determined via an assessment of: quality, resource use, meaningful use and clinical practice improvement activities.

VHT has shown an ability to adapt its offering according to changing regulatory landscapes, and to do so well ahead of the market. The current product suite is extremely well placed to address key concerns for a key market, while the company's development capability offers considerable scope to grow.

The opportunity

VHT currently have sales representation across the world while VHT products have been used in 36 different countries. Mammography remains the standard bearer for the early diagnosis of breast cancer, with most prominent health organisations recommending all women over the age of 50 get assessed once every two years. In some cases this recommendation broadens to all women over the age of 40.

The US

The company's focus in the short term is on the US market, where the regulatory situation has created a fertile sales environment.

The US Department of Health and Human Services estimated that approximately 65% of women over the age of 40 had a mammogram in the past 2 years. The FDA has reported that there were 39.2m mammograms conducted in 2017 representing 48% of women aged over 40.

In FY18, the average ARR per patient across the business was US$1.97 however prices achieved across recent contracts have been ~US$3.00. At FY18 cost, across the number of women screened in the US in FY18, the total addressable US market is ~US$80m. We believe there is considerable upside to this number however, driven predominately by pricing increases, but also by growth in the number of women scanned each year. As a result of these changes, we view a US TAM of US$250m as a more realistic long term estimate.

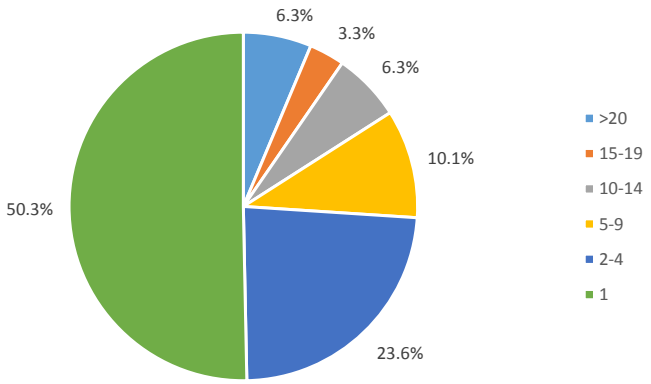
Figure 11: US TAM Matrix

		Cost per patient (US$)								
Penetration of US women > 40yo	US$m	2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00
	48%	78.3	97.9	117.4	137.0	156.6	176.1	195.7	215.3	234.8
	49%	79.9	99.9	119.9	139.8	159.8	179.8	199.8	219.8	239.7
	50%	81.5	101.9	122.3	142.7	163.1	183.5	203.9	224.2	244.6
	51%	83.2	104.0	124.8	145.6	166.3	187.1	207.9	228.7	249.5
	52%	84.8	106.0	127.2	148.4	169.6	190.8	212.0	233.2	254.4
	53%	86.4	108.0	129.7	151.3	172.9	194.5	216.1	237.7	259.3
	54%	88.1	110.1	132.1	154.1	176.1	198.2	220.2	242.2	264.2
	55%	89.7	112.1	134.5	157.0	179.4	201.8	224.2	246.7	269.1
	56%	91.3	114.2	137.0	159.8	182.7	205.5	228.3	251.2	274.0
	57%	93.0	116.2	139.4	162.7	185.9	209.2	232.4	255.6	278.9
	58%	94.6	118.2	141.9	165.5	189.2	212.8	236.5	260.1	283.8
	59%	96.2	120.3	144.3	168.4	192.4	216.5	240.6	264.6	288.7
	60%	97.9	122.3	146.8	171.2	195.7	220.2	244.6	269.1	293.6

Source: OML

The 39.2m women reported by the FDA were assessed across 8,722 accredited facilities, implying ~4500 women are screened per clinic each year, on average. On face value, the large number of separately accredited facilities suggests a high degree of fragmentation. This would obviously create a more arduous sales process, with incremental gains limited in materiality for each facility signed. Closer inspection reveals a more consolidated picture however, with approximately half of the industry aligned with two or more other facilities.

Figure 12: Industry split by no. of clinics within group



Source: OML, FDA

At the top of this list are Integrated Delivery Networks (IDN's), which are growing in prominence. The movement towards IDN's has been in response to a growing demand for high quality, low cost co-ordinated care. One of primary areas of focus is to manage variation and cost, while maintaining quality. These issues speak directly to the *VolparaEnterprise* platform.

We estimate ~6% or ~550 mammogram accredited clinics belong to the top 20 IDN's, at the top of this list is industry leader Kaiser Permanente who manage 91 separately accredited facilities. Of the top 20, VHT have SaaS contracts with 9, while they are in advanced discussions with all of them. Ultimately there is considerable utility in the *VolparaEnterprise* platform for these larger operators, given need for analysis of image quality to be performed at a clinic level, and the considerable burden that exists for practices seeking compliance with the prevailing regulatory regime.

The UK and Europe

While the US represents an excellent near term opportunity due to the changes forced by regulation, VHT's technology retains its applicability to other markets around the world. Breast density is a key issue globally, but achieving high quality images can also deliver benefits to the facility by avoiding retakes, ensuring patient comfort and allocating resources efficiently.

The UK represents an interesting opportunity due to the world leading National Health Service Breast Screening Programme (NHSBSP). The NHSBSP offers all women aged between 50 – 70 an invitation for a breast cancer screen every 3 years. In 2017, 2.2m women were screened as a part of the programme.

Since 2009, a study has been conducted within the NHSBSP, this study is called Predicting Risk of Cancer at Screening (PROCAS). The initial iteration involved approximately 57k women over 6 years, and was designed to gather a range of lifestyle and physiological variables as a means to develop a breast cancer risk score; breast density was one of those variables.

The study has now been renewed (PROCAS II) in order to properly assess its practical application and build the appropriate infrastructure to efficiently inform patients of their score. In its entirety, it is expected that this study will run for 3 years. Within this study, *VolparaDensity* has been selected as the vendor of choice for the measurement of breast density.

The benefits to VHT from this decision are twofold. Firstly it positions the company as the provider of choice to the NHSBSP, with successful completion of the study

paving the way for adoption of calculated risk scores, aided by VHT platforms, across more than 2m women per year. Secondly it once again reinforces the company's expertise and reputation as a leader in breast imaging in the UK, and the rest of the world.

Via participation in the NHSBSP, brand awareness for Volpara products is heightened, creating an expanded opportunity across the broader breast screening market in the UK. In 2017 there were 12.9m women over the age of 50, while there were 8.5m aged between 50 and 70. Applying a similar approach to our previous US TAM, we estimate that in the UK alone the revenue opportunity is ~$35m p.a.

Rest of World

The UK isn't the only country offering a federalised breast screening program, in fact such programs exist in 26 countries around the world with Europe a focus. An interesting conversation has been developing in the region however, with some research indicating that breast screening is not as effective as hoped. A repeated talking point is the over-diagnosis of breast cancers, or the failure to pick up early stage tumours due to the aggressiveness of the cancer between screening.

There is therefore a movement to improve screening programmes by refining the process, modifying the technique according to each patients risk profile or offering more education. We believe this creates a strong long term opportunity for VHT, as they continue to build out the offering while leveraging their existing IP.

To be clear, research has not been advocating removing mammograms as a diagnostic tool altogether. Rather it has highlighted the trade-off between the positives (early diagnosis) and negatives (over-diagnosis), with the recommendations largely focussed on quality improvement. VHT can play a key part in that conversation.

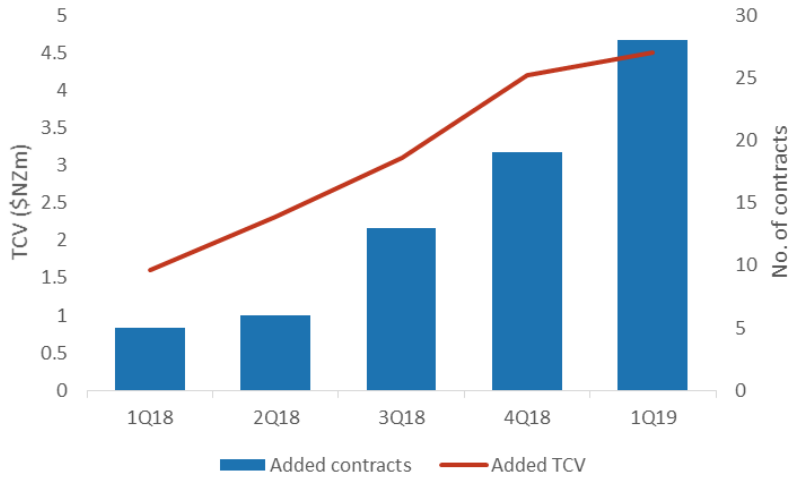
The APAC region further represents a largely underdeveloped opportunity, with diagnostic imaging in early stages of adoption in countries such as China and India. VHT see an excellent long term opportunity in the region however, and in Nov-17 achieved full regulatory clearance for their suite of products in Japan and Taiwan. Japan in particular represents a compelling opportunity with 3,200 mammography machines across the country with over 41m women aged over 40. Furthermore, studies have revealed that Asian women have a higher incidence of breast density, making the issue particularly pertinent. A conversation on the merits of informing patients of their density is ongoing in Japan, while some local municipalities have begun informing already.

Ultimately we see breast cancer screening remaining a key part of diagnosis for the foreseeable future, and VHT is positioned to play a key role in that. The market is large and growing, with Siemens estimating the number of women who qualify for breast cancer screening at 250m worldwide conservatively putting the global TAM for VHT at >US$750m p.a.

Capturing the market

Over of FY17, VHT products had analysed 294k screenings in the US, translating to 0.7% of the market. By the end of FY18 VHT had been contracted to screen 1.29m patients or 3.3% of the market p.a., exhibiting impressive growth. This growth came via the addition of 43 enterprise contracts, taking the total number of signed contracts to 57 by the end of the year. In 1Q19 this grew further, with a record number of contracts signed in the quarter (28). Market penetration now sits at 3.7%.

Figure 13: Contract & TCV additions by quarter



Source: OML, VHT

Using the FDA data we can estimate the average number of women screened per clinic each year is approximately 4500. We also know that the average number of women screened per VHT contract as at FY18 is 22,754, implying each VHT contract encompassed ~5 clinics on average.

Figure 14: US Market Key Stats – FY18

	FY18
US Market	
Total US market	39.3
Total no. of accredited clinics	8722
Average no. of women imaged, per clinic p.a.	4507
Volpara Share	
US market share (m, #)	1.3
% of market	3.3%
Total no. of Enterprise contracts	57
Average no. of women/contract	22754

Source: OML, FDA, VHT

Referring back to figure 10, we view these mid – large tier enterprise contracts as the near term sweet spot for VHT with groups including 5 or more facilities accounting for greater than 25% of the market. We estimate 100% penetration in this market segment to require approximately 400-450 enterprise contracts and would translate

to US$30m of revenue at recent prices (US$3.00). The groups include the aforementioned IDN's, with VHT already signing 9 of the top 20.

This segment is especially captive, given the expanded network leads to greater complexity, and increased need for effective enterprise solutions to address regulatory requirements. This is in addition to fewer funding constraints and more streamlined procurement processes.

The company has now forecasted penetration to increase to 9% of all women in the US by the end of FY19, while they have indicated ~20% of the market are either using VHT products or are in active sales discussions. Given momentum to date, and our understanding of the market, we view these targets as easily achievable in the medium term.

The 3.3% penetration achieved in FY18 was driven by 7 dedicated external sales people, achieving an additional NZ$2.5m of ARR, implying NZ$350k per head. We view this as a reasonable benchmark to predict sales performance over the coming years.

Towards the end of FY18, VHT hired an additional 4 sales people who are expected to be established and contribute fully for the crucial Q3 and Q4 sales period. The company further expects to hire an additional 9 people in FY19 who are only expected to make a partial contribution to sales.

Figure 15: Sales targets

	FY18	FY19	FY20
% of US market	3.3%	9.0%	15.0%
Net patient adds p.a.	1.0	2.3	2.4
Opening headcount	7	11	20
Added heads	4	9	0
Closing headcount	11	20	20
New ARR per existing head ($NZk)*	352.4	569.8	336.2
Target ARR per head ($NZk)*	352.4	400.0	400.0
Implied ARR per added head ($NZk)*	n/a	207.5	n/a
No. of contracts per sales rep (averaged)	6.1	5.4	4.8
Total no. of enterprise contracts	57	163	237

Source: OML, VHT; *At FY18 ARR/woman ($NZ2.75)

Achieving 9% penetration of the US market, as guided to by VHT, would require similar sales targets to be reached for the 11 direct sales employees, while the new hires would be required to add ~NZ$200k per head on the basis of a constant sales price. Achieving 15% penetration in FY20 relies on the same sales targets being met, which would take the company to profitability in FY21.

The strategy to focus on the larger enterprises is expected to be supplemented by smaller facilities signing on periodically, with evidence of this shown in 1Q19. There were on average ~9200 women per contract signed in the quarter, showing a large step down in size. This was offset by the achievement of a higher average price per woman ($US3.90). As brand awareness continues to grow in the US, we anticipate an increasing number of inbound enquiries for these smaller facilities.

Given the sales momentum being demonstrated in the business, and the prices being achieved, we view the 9% penetration and $NZ9m of ARR as easily achievable. Furthermore, our forecasts do not currently factor in clients wins outside of the US, including potential for the NHSBSP, or APAC sales, which makes the companies guidance conservative in our view.

Financials

Profit & Loss

Below is the actual and forecast profit and loss statement from FY17 to FY21F. VHT's financial year end is in March.

Figure 17: P&L Statement

	FY17A	FY18A	FY19F	FY20F	FY21
SaaS Revenue	*0.1*	*1.9*	*6.0*	*16.6*	*30.6*
Capital Revenue	*1.5*	*0.6*	*0.3*	*0.3*	*0.3*
Service Revenue	0.2	0.3	0.3	0.3	0.3
Other	0.2	0.7	0.0	0.0	0.0
Total Revenue	**2.0**	**3.5**	**6.6**	**17.2**	**31.2**
% growth		*71.2%*	*87.4%*	*162.2%*	*81.2%*
COGS	-0.7	-0.8	-1.7	-2.9	-4.2
Gross Profit	***1.4***	***2.7***	***4.9***	***14.3***	***27.0***
% margin	*66.8%*	*77.2%*	*74.2%*	*82.9%*	*86.6%*
Sales & Marketing	-5.2	-5.4	-7.7	-8.4	-8.9
Research & Development	-2.3	-3.1	-4.5	-4.7	-4.8
General & Admin	-3.3	-3.0	-3.5	-3.9	-4.0
Other	-0.3	0.0	0.0	0.0	0.0
Total overhead	**-11.2**	**-11.5**	**-15.7**	**-16.9**	**-17.8**
EBITDA	**-9.8**	**-8.8**	**-10.8**	**-2.7**	**9.2**
% margin	*n/a*	*n/a*	*n/a*	*n/a*	*29.7%*
D&A	0.0	-0.3	-0.3	-0.3	-0.3
EBIT	**-9.8**	**-9.1**	**-11.1**	**-3.0**	**8.9**
Net interest	0.3	0.3	0.1	0.1	0.2
PBT	**-9.6**	**-8.8**	**-11.0**	**-2.9**	**9.1**
Tax	0.0	0.0	0.0	0.0	0.0
NPAT	**-9.6**	**-8.8**	**-11.0**	**-2.9**	**9.1**

Revenue

VHT has historically sold their products via a capital sales model, which is reflected in the higher capital revenue line in FY17. This was supported by ongoing maintenance and services revenue, which we expect to continue for the foreseeable further in support of earlier capital sales.

In FY17 the company begun its transition to a subscription/SaaS revenue model, driving ARR to $NZ3.6m by the end of FY18. This drove SaaS revenue to $1.9m in that year. This approach will the focus for the company in the future, with the company guiding to $NZ9m of ARR in FY19. Capital sales will remain a part of the business while they continue to expand their sales capability in Asia, we expect this to cease in FY21.

- **Revenue recognition:** The company has been an early adopter of changes to accounting rules for revenue from contracts with customers. The company partially records revenue upon on boarding (~10%) with another ~30% for annual server and licence fees. The remainder (~60%) relates to volume fees, however contracts are nevertheless negotiated on the basis of a ~$2 per woman cost, while accounting for all revenue components.

Pricing

In FY18 ARR per patient, using ARR over US market share, was $1.97. In 1Q19, incremental ARR/US patient was $US3.90, with non-US contracts inflating the price. ARR related specifically to US contracts were signed at an average price of ~$3.00.

We expect small-mid tier US contracts to continue to achieve pricing of $3.00-$3.50 in FY19, while IDN's are expected to be $US1.50 -$US2.00. We also don't currently split out non-US contract wins from our ARR forecasts, which will have the impact of growing implied ARR/patient.

We also expect the release of *VolparaEnterpriseLive!* to drive pricing increases commencing in FY20, while subsequent product releases thereafter will further drive higher ARR.

Figure 18: Price increases

	FY18	FY19	FY20	FY21
ARR per patient ($US)	$ 1.97	$ 2.62	$ 3.12	$ 3.53

Source: OML

Gross Profit

The largest expense item relates to Azure cloud hosting, with each client hosted separately. We estimate a cost of approximately $750 per contract, per month on average. Sales commissions are also included in COGS. We expect the gross profit margin to remain broadly flat in FY19 before scale and pricing benefits begin to allow for expansion in FY20.

Overheads

- Sales & marketing: This is the largest expense line accounting for ~45% of total costs in FY19 and FY20. This is partially attributable to headcount as well as conference and promotional activities. There were 13 sales people employed in the business in FY18, we expect this to grow to 20 by the end of FY19 and remaining the same in FY20.
- Research & development: VHT expense all R&D and employ 30 people in this area of the business. We expect this to grow modestly in FY19 before flattening out while long term we expect it to remain roughly 10% of revenues.
- General & admin: There were 10 people employed in administrative and head office functions in FY18, we do not expect major changes in FY19 and forecast modest growth in costs over time.

D&A, Net Interest and Tax

- As VHT expense all R&D, the company has a very low D&A expense which relates primarily to office leases and commission contracts.
- The company is not carrying any debt and therefore pays no interest.
- We expect the company to begin paying tax at a 30% rate in FY24 due to carried forward tax losses.

NPAT

VHT is not currently profitable, however we estimate the company will reach breakeven in FY21 and on a monthly run-rate in FY20

Cash flow

VHT has an average quarterly cash burn over the past 2 years of ~$NZ2m. This has meant that the company has needed to raise capital in FY17 and FY19 (May-19) in order to support operations.

We estimate that the company will reach cash flow breakeven in FY21.

Figure 19: Cash flow statement

$NZm	FY17	FY18	FY19	FY20	FY21
Gross cash flow	-8.6	-8.7	-11.0	-5.0	5.8
Net interest	0.1	0.4	0.1	0.1	0.2
Tax	0.0	0.0	0.0	0.0	0.0
Other	0.2	0.6	0.0	0.0	0.0
Operating cash flow	**-8.3**	**-7.7**	**-10.9**	**-4.8**	**6.0**
Capex	0.0	-0.1	-0.3	-0.1	-0.1
Investing cash flow	**0.0**	**-0.1**	**-0.3**	**-0.1**	**-0.1**
Net borrowings	0.0	-0.1	0.0	0.0	0.0
Issue of shares	21.3	0.0	20.0	0.0	0.0
Financing cash flows	**21.3**	**-0.1**	**20.0**	**0.0**	**0.0**

Balance sheet

Figure 20: Balance Sheet

$NZm	FY17	FY18	FY19	FY20	FY21
Cash	12.9	4.8	13.7	8.7	14.6
Receivables	1.2	1.3	1.6	4.3	7.7
Other	0.0	0.1	0.1	0.1	0.1
Current assets	**14.1**	**6.2**	**15.4**	**13.1**	**22.4**
Intangibles	0.0	1.0	0.7	0.5	0.3
PPE	0.1	0.1	0.3	0.3	0.3
Investments	0.0	0.0	0.0	0.0	0.0
Other	0.1	0.0	0.0	0.0	0.0
Non-current assets	**0.2**	**1.1**	**1.0**	**0.8**	**0.6**
Payables	1.1	1.6	1.7	2.0	2.1
Deferred revenue	0.5	0.9	1.7	4.5	8.1
Other	0.0	0.1	0.1	0.1	0.1
Current liabilities	**1.6**	**2.6**	**3.5**	**6.6**	**10.3**
Debt	0.0	0.0	0.0	0.0	0.0
Other	0.0	0.2	0.2	0.2	0.2
Non-current liabilities	**0.0**	**0.2**	**0.2**	**0.2**	**0.2**
Issued capital	62.6	63.2	83.2	83.2	83.2
Reserves	1.7	1.9	1.9	1.9	1.9
Retained profits (losses)	-51.8	-60.6	-72.4	-78.1	-72.6
Equity	**12.6**	**4.5**	**12.7**	**7.0**	**12.5**
Net debt/(cash)	-12.9	-4.8	-13.7	-8.7	-14.6

- Cash: VHT had $NZ4.8m in cash at the end up FY18, however the company subsequently raised $NZ20m early in FY19.
- Working capital: Majority of clients are invoiced annually (~85%) with contract payable in full, in advance. The remainder are invoiced monthly/quarterly.
- Deferred revenue: Upon invoicing, VHT records as revenue amounts attributable to on boarding and licencing, and as deferred revenue the difference between those amounts and the invoice value. As revenue obligations are met over the year (volume), the deferred revenue balance falls and revenue is recorded.

Valuation

We value VHT using a 10yr Discounted Cash Flow (DCF) method in order to account for long term profit growth. Using a waac of 13.4% and a terminal growth rate of 3.5%, we arrive at price target of $0.91, implying an FY20 EV/Sales of 8.7x.

Figure 21: DCF inputs

Key DCF inputs		Key DCF outputs	
Risk free rate	5.0%	Explicit cash flows	62
Equity risk premia	6.0%	Terminal item	88
Beta	1.40	**Enterprise value**	**149**
Cost of Equity	13.4%	Less net debt (add cash)	-9
Cost of Debt - After tax	5.3%	**Equity value**	**158**
D/EV	0.0%	Diluted share count	183
WACC	**13.4%**	**Equity valuation p.s. ($NZ)**	**0.87**
Terminal growth	3.5%		
		Roll forward at ke	0.99
		Equity valuation p.s. ($A)	**0.91**

Source: OML

We view our long term forecasts as conservative with the company achieving a long term (FY28) penetration in the US of 30% with no contribution from global sales, while we estimate FY28 ARR/woman of $US4.00 compared to $US1.97 at the end of FY18

Comparison

Our chosen ASX listed, software peer group currently trades on an average FY20 EV/Sales multiple of 7x, with an average FY20 revenue growth rate of 28.6%. We believe VHT deserves to trade at a modest premium to the average given the higher growth, while acknowledging the company will not reach profitability until FY21.

Figure 22: ASX listing software comps

Name	Mkt Cap	FY19 EV/Sales	FY20 EV/Sales	FY19 Sales Growth	FY20 Sales Growth
Wisetech Global Ltd	4584.83	15.82	12.82	32.8%	23.3%
Pro Medicus Ltd	868.30	18.07	15.22	24.3%	18.7%
Class Ltd	258.86	5.90	5.12	16.5%	15.3%
Xero Ltd	5943.96	9.09	7.19	29.1%	26.4%
Technology One Ltd	1564.46	4.51	4.06	9.9%	11.2%
Altium Ltd	2657.81	11.60	9.75	20.0%	18.9%
Pushpay Holdings Ltd	1038.12	4.96	4.28	49.8%	16.0%
Iress Ltd	2001.51	4.35	4.09	6.9%	6.2%
Myob Group Ltd	1859.23	4.62	4.25	8.9%	8.8%
Bravura Solutions Ltd	694.16	2.90	2.70	10.9%	7.5%
Volpara Health Technologies	134.99	18.48	7.34	85.7%	162.2%
Average		**9.12**	**6.98**	**26.8%**	**28.6%**
Median		**5.90**	**5.12**	**20.0%**	**16.0%**

Source: Bberg, OML

We further view Pro Medicus Ltd (PME) as a useful benchmark as an Enterprise imaging software company with sales in to the US healthcare industry, including mammogram facilities. PME is trading on an FY20 EV/Sales multiple of 15.2x, while growing revenue at ~20%.

Competition

Currently, *Volpara Enterprise* is the only platform being sold in to the US that is specifically focused on mammography. It is also the only product which delivers information on density, dose and compression regardless of the machine manufacturer (vendor neutral).

Furthermore, a range of studies have demonstrated not only the efficacy of *Volpara Density*, but also that it is the most reliable tool for the objective assessment of density compared to major competitors. Many of these competitors are equipment manufacturers, with a focus on the machinery rather than the software. This has created an opportunity for Volpara to leverage their expertise and capture market share.

Figure 23: Competitors

	Imaging	Breast specific	Clinic analytics	Density	Dose	Compression	Positioning
VHT	✓	✓	✓	✓	✓	✓	✓
iCAD	✓	✓	✗	✓	✗	✗	✗
Densitas	✓	✓	✗	✓	✗	✗	✗
Magview	✓	✓	✓	✗	✗	✗	✗
Hologic	✓	✓	✗	✓	✗	✗	✗
GE Healthcare	✓	✗	✗	✗	✗	✗	✗
MammoRisk	✓	✓	✗	✓	✗	✗	✗
Siemens	✓	✗	✓	✗	✗	✗	✗
Sectra	✓	✗	✓	✗	✗	✗	✗

Source: OML

- **iCad:** US domiciled, NASDAQ listed breast imaging technology company. Not currently profitable, it has a module focussed on breast density as well as 3D imaging and a detection assistance tool.
- **Densitas**: A Canadian company founded in 2011 which only received FDA approval for its density product in Apr-18. Limited product scope and low existing penetration.
- **Magview**: An enterprise solution which has a range of features including patient communication, image retrieval and clinical notes. The platform does not have its own density module however does facilitate integration with other products, including Volpara.
- **Hologic:** The premier mammography equipment supplier by market share in the US, it also offers a density product called Quantra which is only accessible across Hologic equipment. They also provide computer aided detection (CAD) software for assisted diagnosis.
- **GE Healthcare:** A US domiciled subsidiary of multinational conglomerate GE, the company is one of the major suppliers of medical equipment across the US. While their software offers imaging and some level of quality assurance,

the breadth of the offering is limited. In Jan-15 VHT announced an agreement with GE Healthcare to distribute VHT products.

- **Statlife (Mammorisk):** A Boston based company which seeks to aggregate lifestyle and family history factor to prove a predictive risk score for breast cancer. Mammorisk has a breast density feature, but is otherwise limited in scope.
- **Siemens:** A German conglomerate who represents one of the world's larges supplier of diagnostic imaging equipment. Siemens have their *teamplay* platform which seeks clinic optimisation via controls over dose, duration, patient times etc. None of their solutions addresses density, dose, positioning and compression.
- **Sectra:** A Swedish medical device company, Sectra has a diagnostic workflow platform with an image retrieval and review functions. However, there are no features addresses key EQUIP requirements (dose, compression, positioning) or density.

Key People

Board

Roger Allen, AM – Chairman

Roger was appointed Chairman in October 2015 and has been an investor in the company since 2010. He is an experienced entrepreneur having founded Computer Power Group (CPG) in the 1970's from a start up to a global company operating in 12 countries and employing 3000 people, culminating in its ASX listing and subsequent acquisition. Roger has served on high profile government advisory councils and acted as Deputy Chairman of Austrade from 1990 to 1997. He has also been awarded an Order of Australia for services to the IT sector.

Dr Ralph Highnam – CEO & Executive Director

Ralph is a founding director of VHT, with his work as a research scientist at Oxford University forming the basis for the development of VHT's product, particularly *VolparaDenstiy*. Following his time at Oxford, Ralph formed Mirada Solutions with co-founder Professor Sir John Mike Brady, which became the number on provider of image registration and fusion tools before being acquired by CTI Molecular (later Siemens). Prior to founding VHT Ralph consulted for world leading imaging companies including Siemens and Hologic and has published numerous articles and books on breast imaging.

Professor Sir John "Mike" Brady – Non-Executive Director

"Mike" is currently Professor of Oncological Imaging at Oxford University and has served on a number of boards including FTSE 250 Company Oxford Instruments and Mirada Medical, which develops medical image analysis software installed in thousands of hospitals worldwide. He many publications and articles have been widely cited and he is considered a global thought leader in diagnostic imaging.

Lyn Swinburne AM – Non-Executive Director

Lyn founded the Breast Cancer Network of Australia (BCNA) and is the current Chair of the Board of the Royal Women's Hospital in Melbourne. She is recognised for her strong advocacy of women's health issues and was a finalist in the Australian of the Year in 2006, before being named Melburnian of the year in 2007.

John Pavlidis – Non-Executive Director

John previously served as President of the Ultrasound group at Siemens Healthcare before acting as President and CEO of R2 Technology, the pioneer in CAD of breast cancer, which was subsequently acquired by Hologic. He has been CEO of multiple leading medical device companies and is currently CEO of VytronUS.

John Diddams – Non-Executive Director

John is the principal of an Australian CPA firm and offers corporate advisory services. He is currently a non-executive director of ASX listed Experience Co Ltd.

Paul Reid – Non-Executive Director

Paul joined the board in Mar-18. He has experience in technology/SaaS businesses having founded fast growing Figured Limited after holding a number of executive roles in Air New Zealand, MetService and E&Y. He is currently a Director of Christchurch International Airport Limited and NZX listed Comvita Ltd.

Key Management

Dr Ralph Highnam – CEO

As above

Mark Koeniguer – Chief Commercial Officer

Mark is leading the US sales effort and has been involved in medical imaging, software and medical devices for ~30 years. He has held careers at R2 Technology and GE Healthcare, among others. Prior to joining VHT he was Chief Commercial Officer at UL Workplace Health and is based in the US.

Craig Hadfield – CFO

Craig was appointed CFO and Company Secretary in Mar-17, prior to which he worked as an Associate Director at Deloitte. He is a Chartered Accountant and an affiliate member of Chartered Accountants Australia & NZ.

Julian Marshall – Chief Product Officer

Julian was initially a software developer and has held roles at R2 Technology and Hologic. While working at Hologic he was responsible for managing all of the company's breast imaging products, before moving to Hologic's Global Strategic Innovation Group.

Volpara Health Technologies Ltd

Buy

PROFIT & LOSS (NZ$m)	2017A	2018A	2019E	2020E	2021E
Revenue	2.0	3.5	6.6	17.2	31.2
Operating costs	(11.2)	(11.5)	(15.7)	(16.9)	(17.8)
Operating EBITDA	**(9.8)**	**(8.8)**	**(10.8)**	**(2.7)**	**9.2**
D&A	(0.0)	(0.3)	(0.3)	(0.3)	(0.3)
EBIT	**(9.8)**	**(9.1)**	**(11.1)**	**(3.0)**	**8.9**
Net interest	0.3	0.3	0.1	0.1	0.2
Pre-tax profit	**(9.6)**	**(8.8)**	**(11.0)**	**(2.9)**	**9.1**
Net tax (expense) / benefit	-	-	-	-	-
Normalised NPAT	**(9.6)**	**(8.8)**	**(11.0)**	**(2.9)**	**9.1**
Reported NPAT	**(9.6)**	**(8.8)**	**(11.0)**	**(2.9)**	**9.1**
Normalised dil. EPS (cps)	(31.8)	(6.0)	(7.4)	(1.6)	5.0
Reported EPS (cps)	(31.8)	(6.0)	(7.4)	(1.6)	5.0
Effective tax rate (%)	-	-	-	-	-
DPS (cps)	0.0	0.0	0.0	0.0	0.0
Dividend yield (%)	0.0	0.0	0.0	0.0	0.0
Payout ratio (%)	(0.0)	(0.0)	(0.0)	(0.1)	0.0
Franking (%)	-	-	-	-	-
Diluted # of shares (m)	142.6	149.4	182.7	182.7	182.7

CASH FLOW (NZ$m)	2017A	2018A	2019E	2020E	2021E
EBITDA incl. adjustments	(9.8)	(8.8)	(10.8)	(2.7)	9.2
Change in working capital	1.2	0.1	(0.2)	(2.3)	(3.4)
Net Interest (paid)/received	0.1	0.4	0.1	0.1	0.2
Income tax paid	0.0	(0.0)	-	-	-
Other operating items	0.2	0.6	-	-	-
Operating Cash Flow	**(8.3)**	**(7.7)**	**(10.9)**	**(4.8)**	**6.0**
Capex	(0.1)	(0.2)	(0.3)	(0.1)	(0.1)
Acquisitions	-	-	-	-	-
Other investing items	(11.6)	10.1	-	-	-
Investing Cash Flow	**(11.7)**	**9.9**	**(0.3)**	**(0.1)**	**(0.1)**
Inc/(Dec) in equity	21.3	0.0	20.0	-	-
Inc/(Dec) in borrowings	(0.0)	(0.1)	-	-	-
Dividends paid	-	-	-	-	-
Other financing items	-	-	-	-	-
Financing Cash Flow	**21.3**	**(0.1)**	**20.0**	**-**	**-**
FX adjustment	-	-	-	-	-
Net Inc/(Dec) in Cash	1.4	2.1	8.8	(4.9)	5.9

BALANCE SHEET (NZ$m)	2017A	2018A	2019E	2020E	2021E
Cash	12.9	4.8	13.7	8.7	14.6
Receivables	1.2	1.3	1.6	4.3	7.7
Other current assets	0.0	0.1	0.1	0.1	0.1
PP & E	0.1	0.1	0.3	0.3	0.3
Intangibles	0.0	1.0	0.7	0.5	0.3
Other non-current assets	-	-	-	-	-
Total Assets	**14.2**	**7.3**	**16.4**	**13.8**	**23.0**
Short term debt	-	-	-	-	-
Payables	1.1	1.6	1.7	2.0	2.1
Other current liabilities	0.5	1.1	1.8	4.6	8.3
Long term debt	-	-	-	-	-
Other non-current liabilities	0.0	0.2	0.2	0.2	0.2
Total Liabilities	**1.7**	**2.8**	**3.8**	**6.9**	**10.5**
Total Equity	**12.6**	**4.5**	**12.7**	**7.0**	**12.5**
Net debt (cash)	(12.9)	(4.8)	(13.7)	(8.7)	(14.6)

DIVISIONS	2017A	2018A	2019E	2020E	2021E
Key Stats (NZ$m)					
ARR per woman ($NZ)	2.8	2.8	3.7	4.5	5.1
ARR per woman ($US)	2.0	2.0	2.6	3.1	3.5
US market share (m)	0.4	1.3	3.6	6.0	8.1
US market share (%)	1.0	3.3	9.0	15.0	20.0

KEY METRICS (%)	2017A	2018A	2019E	2020E	2021E
Revenue growth	(21.7)	72.7	85.7	162.2	81.2
EBITDA margin	-	-	-	-	29.7
OCF /EBITDA	87.3	98.6	101.9	186.5	63.1
EBIT margin	-	-	-	-	28.6
Return on assets	-	-	-	-	48.5
Return on equity	69.7	-	-	-	93.0

VALUATION RATIOS (x)	2017A	2018A	2019E	2020E	2021E
Reported P/E	-	-	-	-	16.5
Normalised P/E	-	-	-	-	16.5
Price To Free Cash Flow	-	-	-	-	24.9
Price To NTA	9.4	33.2	12.2	22.4	12.0
EV / EBITDA	-	-	-	-	14.3
EV / EBIT	-	-	-	-	14.8

LEVERAGE	2017A	2018A	2019E	2020E	2021E
ND / (ND + Equity) (%)	4,263.6	1,395.4	1,391.1	518.6	684.1
Net Debt / EBITDA (%)	131.2	55.1	126.7	325.5	(157.9)
EBIT Interest Cover (x)	36.7	32.8	92.6	20.8	-
EBITDA Interest Cover (x)	36.6	31.7	89.7	18.4	-

SUBSTANTIAL HOLDERS	m	%
Roger Allen	20.5	11.4%
Ralph Highnam	18.2	10.2%
Tina Jennings	11.3	6.3%

VALUATION	
Cost of Equity (%)	13.4
Cost of debt (after tax) (%)	5.3
D / EV (%)	-
WACC (%)	**13.4**
Forecast cash flow ($m)	61.6
Terminal value ($m)	87.8
Enterprise Value ($m)	149.3
Less net debt / add net cash & investments ($m)	8.7
Equity NPV ($m)	**158.1**
Equity NPV Per Share ($)	**0.91**
Target Price Method	DCF
Target Price ($)	0.91
Valuation disc. / (prem.) to share price (%)	21.0

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BUY	The stock's total return (nominal dividend yield plus capital appreciation) is expected to exceed 15% over the next 12 months.
ACCUMULATE	We expect a total return of between 5% and 15%. Investors should consider adding to holdings or taking a position in the stock on share price weakness.
HOLD	We expect the stock to return between 0% and 5%, and believe the stock is fairly priced.
LIGHTEN	We expect the stock's return to be between 0% and negative 15%. Investors should consider decreasing their holdings.
SELL	We expect the total return to lose 15% or more.
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