

Writer: Hozar Berxodan  
15/09/2019

## Seeing Machines (M2Z)

Ticker: M2Z  
Price: 3.955 pence = £0.0395  
Shares outstanding: 3.36 billion  
Market cap: £132M  
Cash: £34M (30 June 2019)  
Debt: £0  
Enterprise value: £98M



**Seeing Machines (M2Z)** is a low valued microcap company that is set to dominate the global driver monitoring market. The EU is set to mandate driver monitoring systems (DMS) for cars, trucks and buses from 2022 and with the rest of the world soon to follow, the company is set for explosive revenue growth. It has already won automotive contracts with premium car manufacturers worth between US\$113M - 133M. With world leading technology and legislation forcing OEMs to go for driver monitoring systems the downside risk in this microcap is very low while the potential upside is massive.

**Seeing Machines** is an Australian based driver monitoring company that is listed on the London stock exchange. It develops driver monitoring systems for automotive, trucks, mining, aviation and rail. Its DMS is well tested and have been used in trucks(fleet) and in harsh environments as the mining industry for several years. This has been a tremendous advantage for the company, which uses the data gained from fleet and mining to improve its algorithms in their driver monitoring system.

## **Competitors**

With Seeing Machines being early out with driver monitoring systems in trucks and off-road(mining), the company has gained first mover advantage over competitors such as Smart Eye, Eyesight and Jungo. With real world experience, edge case data and its leading expertise in human factors it has been able to develop a DMS with a highly reliable image sensor.

As the DMS market for automotive is relatively young there are no protocols for the product performance. There are currently no tests other than the validations by the OEMs. The European New Car Assessment Programme (Euro NCAP) is working on defining protocols for driver monitoring systems. As Euro NCAP has tight communication with the OEMs the DMS validations by the OEMs will most likely play a big role in defining the protocols. I believe these protocols will be released in October 2019. For Seeing Machines this is very positive as the OEMs prefer its technology. Even the world largest Tier-1s such as Bosch, Continental and Veoneer have chosen Seeing Machines technology. This clearly demonstrates Seeing Machines superiority in its market.

ADAS features like lane keeping assist, adaptive cruise control, and automated braking for collision will all depend on the imaging subsystem of the DMS as they must act when the DMS sense that the driver is in danger. This requires that the DMS has the highest Asil rating. According to ISO26262 an Asil rating is given based on the probability of a failure occurring and the severity of a failure. The Asil rating scale goes from A-D with D being the highest and ASIL A the lowest. Seeing Machines has been credited Asil D rating while competitors have been given Asil B rating.

In a competitive and safety conscious global automotive market reputational damage must be at the forefront of the OEM's mind. It is highly unlikely that the OEMs will jeopardize their safety reputation and that is why they will choose performance over price. This is obvious if people pay attention. While Seeing Machines continues to stack up OEM wins in Europe and North America the competitors are fighting for low value contracts in the less technically demanding Chinese market.

## **Different DMS technology**

The market has yet to catch up with reality as it believes that there is no difference in driver monitoring systems thus partly explaining the low valuation for Seeing Machines. Driver monitoring systems can be divided into two categories, safety and convenience. A common denominator for them is that both can track the eye gaze of a person and detect driver distraction and monitor fatigue. The difference is that safety DMS can be linked to steering, braking and an accident event data recorder. This requires that the DMS has been credited Asil D rating. The EU will mandate safety driver monitoring systems and is what the safety conscious European New Car Assessment Programme (Euro NCAP) will require if the OEMs want a five-star rating in safety in their cars models. Volvo who has yet to decide which DMS provider it will go for, described the DMS in their future car models as following:

Writer: Hozar Berxodan  
15/09/2019

*“Volvo’s in-car cameras will monitor eye movements to gauge driver distraction and / or intoxication. If a driver looks away for a period of time, such as at a smartphone, or fails to keep their hands on the steering wheel, a representative from Volvo’s on-call assistance centers will call them to check in. Drivers who aren’t watching the road, or even have their eyes closed, will be warned as well. If they don’t respond, the car will slow and even stop. The system will roll-out to all Volvo cars by early 2020.”*

Seeing Machines is currently the only company that has a DMS with a highly reliable image sensor that can be linked to braking and steering.

Mike Lenné who is the Senior Vice President of Fleet and Human Factors at Seeing Machines was recently interviewed in London at proactive investors and hinted that their driver monitoring system is the only one that can guarantee safety. This is what he said:

*“We see a lot of flashy demonstrations at the trade shows that looks fantastic but essentially this is not about flashy demonstrations. This is about really robust rigorous driver monitoring technology, operating monitoring technology that has to work all the time for everybody in every vehicle, in all conditions.”*

Seeing Machines dominance is even confirmed by third-party Colin Barnden, Lead Analyst at Semicast Research, who is an independent provider of market information and analysis of the automotive industry and driver monitoring systems. He recently visited Frankfurt Auto show in September 2019, where he had numerous discussions with Tier-1s regarding ADAS and DMS pairings. A majority wanted Xilinx or Mobileye together with Seeing Machines.

In 2018 Colin Barnden told Chris Menon, financial journalist, the following:

*“On to auto...from a tech perspective, automotive is not a contest. You just can’t compete with an FPGA solution with either an MCU or GPU for DMS. For vision processing you need hardware acceleration to do it in real time, and Fovio can do that. Add in the 1.3 billion kms of data from Guardian and you have a platform that is untouchable. And it is and OEMS know that. DMS is a crowded market and competition for SM extends well beyond SE (Aisin Seiki, Can Controls, Clarion, Eyesight, FotoNation, Idemia, Mitsubishi, Omron, Panasonic AIS, Pioneer). With Fovio FPGA and 1.3 bn kms of data, the competitive position really comes down to SM vs. all others”*

## **Automotive**

The company is set to dominate the global automotive market because of its superior DMS, this is due to the superior algorithms driven by its leading expertise in human factors coupled with access to its 2.8 billion kilometres of real time data which provides it with edge case data that its competitors cannot match. Seeing Machines has already won contracts with BMW, Mercedes, General Motors, Ford, Fiat Chrysler and Byton. In 2016 the company decided to embed its driver monitoring system inside an automotive grade chip (FOVIO) together with Xilinx. This was a strategic move by the company as it will reduce the cost and time of DMS deployment, making it easier for mass market uptake.

Seeing Machines closest competitor Smart Eye won a contract with BMW in 2017. As Seeing Machines was tied up with Takata at that time, it could not bid for the contract. After Seeing Machines decided to end the exclusivity with Takata, who were experiencing major problems associated with its automotive airbags, OEM's deigned not to work with it and therefore it

Writer: Hozar Berxodan  
15/09/2019

could not bid for the contract, it was able to work with other Tier-1s and it shortly after won a contract with BMW in 2018 for some car models and recently won a new extension contract in July 2019, before a BMW vehicle was launched with technology from Seeing Machines.

There are numerous articles published on the internet describing the early DMS from Audi and BMW and its limitations to 37-40 mph per hour. It seems Smart Eye's DMS has been found by both Audi and BMW to not be reliable enough for motorway speeds. While the super cruise from Cadillac with technology from Seeing Machines is allowed up to 81 mph per hour. This is positive for the company as the OEMs seems to have more trust in the DMS from Seeing Machines. This has forced Smart Eye to change focus from Europe to the Chinese market because legislation is less demanding. This is strong evidence that Seeing Machines technology is way ahead of competition and it looks like Smart Eye will be replaced in both BMW and Audi models.

Seeing Machines communicated in early 2019 that they were active in 5 RFQs in the first half of 2019 with two of them being additional OEMs and three of them being mass penetration contracts with existing OEM customers. Two of the mass penetration contracts have already been announced. Seeing Machines cannot reveal to the market the name of the OEMs due to NDAs in the automotive business. Instead, they wrote in their RNS that it was with a German and European OEM and all evidence points to BMW and Mercedes. Nick DiFiore Senior Vice President and General Manager of the Automotive division was recently interviewed by proactive investors in London and he confidently told the market that they are bullish on the RFQs.

In the second half of 2019 Seeing Machines will be active in at least 8 additional RFQs. With an order book from automotive already in the range of US\$113M - 133M. This figure could easily double by the end of 2019 and quadruple by the end of 2020. Since it takes 2-3 years to design new car models all OEMs must hurry and decide which DMS they are going to implement in their cars before legislation kicks in 2022. With a doubled order book and contracts with additional OEMs the share price of Seeing Machines has a very high probability to reach between 9-12 pence per share on auto alone by the end of 2019. Additional OEM wins with the likes of Volkswagen and Volvo would not only increase the order book but would cement and prove to the market that Seeing Machines is the clear leader in its field.

If Seeing Machines management successfully manages to end future funding concerns, the share price of the company has a high probability to reach 30 pence per share in FY2020 as it is very likely that Seeing Machines will have won contracts with additional OEMs such as Volvo, Volkswagen, Toyota and Honda together with an order book between US\$300M - 400M, with the majority off it to generate revenue in 2021-2024 period based on projected lifetime OEM volumes. The company recently announced a new job in Japan for DMS testing with an additional OEM. This is a strong indication that Seeing Machines is also set to dominate the Japanese market. The Japanese are known for being quality conscious that is why I am sure it will go for nothing but the best.

As the European Parliament is set to mandate DMS for newly introduced car models in 2022 and for all new vehicles in 2024 the OEMs will gradually equip all their car models with DMS and that means by 2022 around 30% of all new produced cars should be equipped with driver monitoring systems. With Seeing Machines expected to take at least 60% of the global

driver monitoring market, that means their technology would be inside of approximately 13.5 million cars. With Seeing Machines expected to charge about US\$30 for its embedded FOVIO chip and around US\$10 for the software the mean value cost of their DMS would be around US\$20 per car. That would mean an annual revenue stream in the range of US\$270 million in 2022 and if we expect 80% of all cars globally to be equipped with DMS and with Seeing Machines expected to at least take 60% of the global automotive market in 2024, that would mean their DMS would be inside of approximately 36 million cars and would generate an annual revenue stream of US\$720M.

OEM	Cars produced year (2018)
Volkswagen	11 000 000
Volvo	642 253
BMW	2 125 026
Mercedes	2 310 185
Toyota	10 590 000
Honda	5 190 000
GM	8 400 000
FCA	2 240 000
Ford	2 500 000
Byton	No Data (New OEM)
Total	44 997 464

With high gross margins communicated by the company, it would not be surprising to see the company valued 15 - 20 times its annual revenues as a market leader and if we assume that fleet, aviation and rail deliver zero revenues, this would value the company between 101 - 135 pence per share in 2022 and 180 - 270 pence per share in 2024. Mobileye, automotive vision specialist was bought by Intel for US\$15.3 billion for a whopping 42 times its annual revenues in 2016. If this taught the market anything it would be that things in automotive are not sold on the cheap. If Seeing Machines were to be valued with the same multiples the company would be worth around 284 pence per share in 2022 and 757 pence per share in 2024, on automotive alone. Once all the RFQs are sorted there is a high probability of a takeover as some large player will realise the potential. I expect it to be done long before 2024.

## Fleet

Last year the fleet business was facing major setbacks because of a global capacitor shortage that delayed hardware manufacturing. This affected the installation rate and the expected revenues for FY2019 was lowered. The business model for fleet was also not cost efficient. There have been multiple changes, for instance the fleet team was reduced by over 30% to minimize the costs together with hardware simplifications, distributors now operate the installation process and hold that cost and a contractually timescale is agreed for the installation of Guardian with the customer. With upcoming legislation forcing buses and trucks to be implemented with driver monitoring systems the fleet business has a tremendous potential to be a future cash cow. The company does not make much money on hardware sales, but a monthly recurring revenue is generated of around US\$60 per unit for the 24/7

Guardian monitoring centre service. In 2019 deals have been signed with commercial fleets in New Zealand and National Express in the UK. Since the second-generation Guardian product is now on the market, the hardware cost of the Guardian has been reduced significantly and that should increase the installation rate at a much faster pace than previous. Total connected Guardian units in FY2019 reached 16000 with expected US\$9.6M in annual revenue, as the installations begin to ramp up again, I believe 40000 units will be connected in FY2020 with US\$29M in annual revenues and that would take Seeing Machines to breakeven. Depending on insurance tie ups in FY2021 there could be over 80000 units connected. Similarly, FY2022 with legislation pushing for DMS in trucks/buses and depending on both insurance and a further logistics tie ups there could be around 150 000 units connected. That gives annual revenues from fleet of around US\$57.6M in FY2021 and US\$108M in FY2022. In this case, annual revenue from fleet and automotive would reach US\$378M in FY2022. With a Mobileye type of valuation the company would be worth 396 pence per share.

### **Mining**

In 2013 Seeing Machines licensed their off-road product to Caterpillar for US\$17.5M. The contracted recurring royalty payments in mining, represented annualised recurring revenue of around A\$6.2 million for DSS hardware, software licensing, monitoring and analytics services in FY2019. Seeing Machines receive around 10 - 15% of the growing royalty stream and monthly revenues from sales of its product with a 100% margin.

### **Aviation**

As pilot fatigue is a serious issue in the aviation industry, Seeing Machines has been working with the world's best airlines such as Qantas and Emirates and as well as with the leading flight simulator suppliers to implement fatigue and distraction monitoring technology. Seeing Machines has a tie up with L3 through Qantas and if there is future news from Emirates it would most likely give Seeing Machines a tie up with CAE. In this case 76% of the FFS market would be covered. It would be no surprise to see the rest of market to follow.

Manufacturer	Market share
CAE	56%
L3	20%
FSI	10%
Others	14%

Seeing Machines is not only aiming for installation at factory but also in the retrofit market. If the OEMs require the Tier-1s to implement Seeing Machines technology, and as FFS lifetimes are long, they will have to retrofit. There is also a huge market opportunity for Seeing Machines to implement its technology in air traffic control systems.

In July 2019 Paul McGlone, CEO of Seeing Machines, said in an interview with proactive investors that aviation news will come shortly. There could be a licensing deal on the way that could take Seeing Machines closer to breakeven in FY2020.

## **Rail**

Seeing Machines has been collaborating with Progress Rail, a Caterpillar subsidiary, to implement fatigue and distraction monitoring systems in locomotive applications. It has an exclusive license deal on royalty basis. The revenue stream from rail is currently very small but could generate a notable amount of cash in the future.

## **Financials**

Seeing Machines raised £27.5M in April 2019 and communicated that they would for the first time use the money on growing the business and cement their position in the automotive sector instead of focusing on R&D. As most of the automotive revenue will flow in from 2022 and onwards the company could reach a dangerous low level of cash early 2021. To prevent further dilution the management is seeking to do license and royalty type of deals for fleet or aviation, which would give a large upfront cash payment. The company did a similar deal with Caterpillar in 2013, which gave US\$17.5M. Any type of deal like that would be a game changer and would take Seeing Machines to breakeven in FY2020. As the problems with the fleet is now in the past, the fleet business is gaining momentum again it and could well exceed our expectations. Therefore, the fleet business could also be the gamechanger and take Seeing Machines to breakeven in FY2020.

## **Management**

The previous management, which was replaced in 2019, did a lot of blunders that caused the fleet debacle last year and the ludicrous discounted fundraise in 2019. The ex-CEO left his position as the company got too big for him and was verified by himself. Although he is partly responsible for setting Seeing Machines up for what is coming, he had taken the company as far as he could a while ago and was not the right man to be the CEO of a potentially multi-billion-pound company. According to Seeing Machines, the CFO came to an agreement with them to resign just after 8 months, as he decided to pursue an opportunity in his hometown, Sydney. As most experienced investors know, when a CFO leaves a company that could mean bad financial results are coming. In this case the trading update after his departure was slightly ahead of expectations, which was relieving. Paul McGlone was set from interim to permanent CEO of the company in July 2019. He has the right background and fleet has gained momentum again under his leadership, nevertheless it is still too early to say whether he is the right person to push Seeing Machines into its fullest potential. We must wait and see what his leadership brings. September 23<sup>rd</sup> will tell us that.

Writer: Hozar Berxodan  
15/09/2019

This paper is based on my own research and predictions. Always do your own research before investing with your hard-earned money. Do not take anything in this paper as facts.