



Technology Brief...

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Research, Analysis, Strategy, Insight

BlackBerry IVY – Enabling Sensor Data and Analytics in Vehicles

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The battle for relevance in supplying the “brains” of modern vehicles is intense, as car companies enhance the processing capabilities of their products with advanced hardware and software for an increasingly wirelessly connected “data center on wheels”. While this is especially important in the emerging autonomous vehicle area, it’s not exclusively a function of autonomous driving. Indeed, there are many enhanced features being offered now (e.g., infotainment, “smart” engines and transmissions, collision avoidance systems, vehicle diagnostics, enhanced GPS, etc.), even before autonomous vehicles become generally available. The amount of software-enabled processing going on in cars and its management and ability to be remotely updated is a critical feature in the lifecycle of car design as well as needed for keeping cars on the road long term. It also allows manufacturers to offer add-on services, to enhance revenues and sell additional paid features to consumers. And with the enablement of high speed wireless 5G services, the needed connectivity is becoming available to make this a reality.

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To stay relevant in the space, current Operating System providers (e.g., BlackBerry QNX) need to upgrade to a more inclusive approach, rather than simply offering an embedded RTOS. Since BlackBerry is already a leading provider of automotive OS and hypervisor solutions for most of the major auto makers, and with its major investments in security enablement through its previous acquisition of Cylance, it is looking to its next logical evolution of its embedded products by moving up the value chain to enhanced services. To this end, BlackBerry has created IVY, a scalable cloud-enabled secure software platform to read vehicle sensor data, normalize it, and create actionable insights and do it both in the vehicle and in the cloud. To enable a variety of cloud-based deployments and options, BlackBerry is partnering with AWS and its assortment of products for cloud enablement. By leveraging BlackBerry QNX’s automotive software expertise and AWS’s broad portfolio of services, including IoT targeted features and machine learning assets, IVY will be able to run both at the edge of the network as well as internally to the vehicle. And all assets will be uniformly managed and configured from a management function based in the cloud.

IVY is both a major step for BlackBerry as well as a critical need for automakers. The wide variety of vehicle sensors with their unique data formats make the task of engineering a completed vehicle highly problematic, as it requires a myriad of different expertise and skill sets to accomplish. BlackBerry IVY will feature in-vehicle standardized APIs to access sensor data, analyze that data (including through machine learning) and share the insights created. Further, a data

abstraction layer in BlackBerry IVY maintains vehicle data and driver privacy as well as ensures reliable functioning of safety-critical systems. Safety in vehicles is of primary importance, since operator harm may be a result of failure.

BlackBerry IVY is a major step forward for automakers that procure thousands of unique products with various connectivity requirements, which means a long and drawn out design cycle. By creating a “universal” connection point, BlackBerry IVY has the potential to both speed-up designs resulting in shorter development cycle, as well as enabling lower cost to both automakers as well as consumers. Finally, by creating a universal interface mechanism and making the data accessible broadly, BlackBerry IVY can open up a new venue for services (e.g., maintenance monitoring, driver operational safety, etc.). And with the power of cloud services that can easily be expanded, the amount and variety of data analysis will continually increase.

Bottom Line: While clearly BlackBerry won’t be the only company to target this space, its close working relationship with auto makers gives it an advantage. New ways for auto makers to address the complexity within their vehicles, as well as take advantage of the potential 5G connectivity brings, means the market is ripe for an integrated approach and cloud-based solutions. The partnership with AWS brings BlackBerry a large set of tools to create services. If BlackBerry can pull this off, it has the potential to propel them to the top of the supply chain for all things sensors and data in the automotive market.

Microsoft Azure Synapse – Bringing a Cloud Native Approach to Analytics

There is a growing battle among cloud providers, as well as third parties, to enable a broad set of analytics functions that can bring valuable insights to the massive amounts of data enterprises are storing in data warehouses in the cloud. Indeed, the top challenge for most enterprises creating an Enterprise Data Cloud is how to make use of the vast amounts of data available. We estimate that currently 85%-95% of such data never gets analyzed, and thereby adding no value to the organization. Microsoft wants to do something about that.

Originally launched at Microsoft’s Ignite conference in 2019, Azure Synapse envisions itself as the premiere address for analytics and analysis of such data. There are many tools available within Azure for big data processing, integration, and data transformation, but there is still a great deal of complexity in putting together a complete solution. What Microsoft wants to do with Azure Synapse is to provide agility (by enabling the addition of third party task-specific apps), but also remove the complexity for users of managing networks and data clouds. Synapse is the first cloud-native platform for analytics on Azure that can be deployed almost instantly and with little specialized expertise needed. Given its much more complete integration of tools, it goes a long way to achieving this goal.

Synapse is promoted as the next generation of the Microsoft SQL Data Warehouse, and it includes analytical processing as an embedded component. It is scalable from tens of users to thousands of users. It’s also available either as a pay per query serverless capability (i.e., rent the product as needed with no commitment to a specific cloud implementation), or it can be enabled as a dedicated SQL connected process on a typical cloud based virtual installation. Synapse uses the Microsoft Polaris Distributed Query Engine, which Microsoft claims is the only platform that has achieved a TPC-H benchmark of 1 petabyte.

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While this is an impressively high benchmark, and most users probably won't need that kind of performance, it does show the ability of Synapse to scale, which is a good indication of the processing speed available even for smaller jobs.

Synapse consists of a number of important tools, including; Synapse Studio, a SQL editor with automated code completion, built-in visualizations and easy switching to different clusters; impressive security that can create highly granular access control policies down to the single cell of the data with 3 levels of encryption and applied policies per user; Azure Purview Data Governance providing cataloging and search, automated classifications and data use policies; and Synapse Link that links various data bases for processing (available on Cosmos DB now but will expand to others in the future). While third party additions may still be needed by some organizations, this is a fairly complete offering that will be enough for many enterprise users

Bottom Line: Microsoft is feeling a lot of pressure from other traditional cloud enabled data warehouse vendors (e.g., AWS, Google) who also include analytics as part of their offerings, as well as third parties (e.g., Cloudera, Snowflake). Analytics and BI is the next great battleground for cloud based systems as companies struggle to define how to gain valuable insights from their stored data assets. While AI is important, many tools exist for problems that don't require full blown AI which is hard to train and implement. Microsoft wants to enable quick to market, quick time of discovery, and ease of implementation by offering a cloud native and low overhead approach as part of Azure. We believe this to be a good step for Microsoft to enhance its competitiveness as it continues to gain market share for Azure in enterprise deployments.

Kigen Seeks to Bring the SIM Card into the 21st Century

Nearly all wirelessly connected devices on a cellular network (e.g., smartphones, tablets, IoT, vehicles, etc.) require a SIM in order to be provisioned by and operate on that network. Over the past couple of years, the industry has moved to a more standardized approach to SIM, compared to earlier processes that were often unique to a carrier. With the proliferation of all manner of wireless devices, especially as we transition to 5G, the number of SIMs deployed has exploded. But SIM cards present a space requirement and connector issue for devices that continue to shrink. This is especially true in the reduced-size world of many IoT devices where a physical SIM may be impossible to accommodate. As a result, there is a move to replace physical SIM cards with electronic versions that are built into each device and can be securely programmed with a unique code, rather than requiring a unique built-in hardware identifier as is the case in a physical SIM card.

The first stage of this move came approximately 3 years ago with the eSIM movement, where a special chip was embedded inside the device. This allowed a programmable ID to be placed inside a fully protected "vault" that could be read by the device and the network. The eSIM could be programmed with the right security access, so the device could be portable across networks without the need to change a physical card. However, it remains an independent piece of hardware, that took up space on the board and added cost to the device bill of materials.

Recently, with the increase in sophistication of mobile processors, including with the inclusion of protected vaulted areas on the chip (e.g., ARM TrustZone), there has

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been a move to create an integrated SIM capability directly in the processor. A leading proponent of this new iSIM function is Kigen, a subsidiary of ARM which is the largest supplier of intellectual property (IP) for mobile processors. Kigen is moving towards being an independent company and it believes its IP to address the iSIM market, together with its related operating system and services to manage the iSIMs once in the field, will provide it the necessary scale to be successful.

iSIM technology has significant benefits. Since it's essentially an integrated IP solution that can be embedded in almost any chip using TrustZone or similar dedicated vault, it eliminates the need for a standalone SIM chip/chiplet or plugin on the device. This has many advantages. The iSIM can potentially be reprogrammed over the air (although this could present some security issues that need to be addressed). It reduces substantially the Bill of Materials (BOM) costs as no SIM-specific hardware is required. It reduces the amount of space required on the circuit board which makes devices smaller and/or leaves more room for premium additions like bigger battery, larger cameras, etc. Its direct connection to the processor means apps that require continuous SIM access perform much better. And it uses very little power so it increases the battery life of the device. But to make this all work requires both hardware and software IP, including an iSIM operating system and cloud based services for programming, provisioning and monitoring. Kigen feels it can lead in all of these categories, and has products available now.

Bottom Line: While this is an interesting technology and will ultimately be widely adopted, it's likely to be several years before this technology is broadly implemented. There is current momentum to move to eSIM from many vendors, but this movement is slow and will take a couple of more generations at least to have a major impact. We expect iSIM to be a 3-5 year implementation timeline before it achieves substantial installations, and it's likely to transition first in more dynamic markets such as China and India. Still, iSIM will ultimately be a successful technology from which Kigen should be able to benefit, although it will need to be patient until iSIM catches on.



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About J. Gold Associates, LLC.

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