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Emerging AI Opportunities with IoT Solution Aggregator





As a solutions aggregator, WPI helps customers tap emerging AI opportunities

In the last couple of years, Artificial Intelligence (AI) once again took center stage and this time it is different from the previous two waves of developments which focused mainly in technology sectors. Today AI combined with high-performance computing and big data analytics can be applied across almost all sectors and therefore is grabbing attention from major industries as it is believed AI will play a critical role driving global industry transformation toward smartization. The large scope of potential applications introduces challenges on AI platform providers' abilities to vertically integrate across industries. AI also poses a high technological barrier to firms across different industries looking to make use of AI.

There is a wide technological gap to be filled between the supply and demand of AI. In view of this, Intel® is promoting its "Intel® IoT Solution Aggregator" initiative in hopes of bridging the gap. WPI, as one of the four Intel IoT Solution Aggregators and the world's No. 1 semiconductor distributor, has established a software division focusing on AI development to augment its existing hardware capabilities. By doing this, WPI hopes to integrate know-hows of different industries and help customers build ready-to-use vertical solutions with fast time-to-market to grab market opportunities.

AI is a clear direction to go for the global industry. Whoever can stay even slightly ahead of the competition will be able to obtain first mover advantage and secure a market share. However, as mentioned above, businesses need to overcome high technological barriers, in both information technology (IT) and specific industry know-how, to be able to come up with optimized AI systems suited to their applications.

Rising AI trend spurs diverse applications

Any AI system comprises two elements - software and hardware. The selection of software and hardware architectures depends on the purpose for which the



AI system is being built for. Firms incorporating AI generally look to leverage its computing power to help with business operations. Only with a clear understanding on what the AI system will be used for can a suitable hardware platform and software architecture be selected.

Image recognition is currently the most popular AI application thanks to widespread availability of cameras and clear applications, such as access control, customs and immigration, and face identification in law enforcement. Growing use of AI in image recognition has given rise to the popularity of AI. Furthermore, the voice assistants that are widely featured on smartphones and smart home devices in recent years can extend from speech recognition to voice authentication. With advancing voice recognition technologies and improvements on natural language processing, wide-ranging applications can be expected for the future. In fact, system developers have built deep learning based chatbots capable of processing natural language text input, which are being put to use in customer service interactions for the financial services and retail industries.

Current market developments indicate that AI is being used across wide-ranging applications. In particular, Artificial Intelligence of Things (AIoT), the combination of AI concepts with Internet of Things (IoT) infrastructure, is expected to become the backbone of many industries in the future. However, for AI to be incorporated in existing business systems to make them smart and usable, it is critical that system developers are able to meet user needs. This also challenges system developers' R&D capabilities. Most suppliers have made development kits available



to system developers to help with their product R&D. As the world’s top CPU manufacturer, Intel® is making every effort toward AI development. Aside from offering AI chips, Intel® also made its open source toolkit – OpenVINO™ available to system developers in 2018 to help them build AI applications.

Intel® product roadmap meets four major market demands

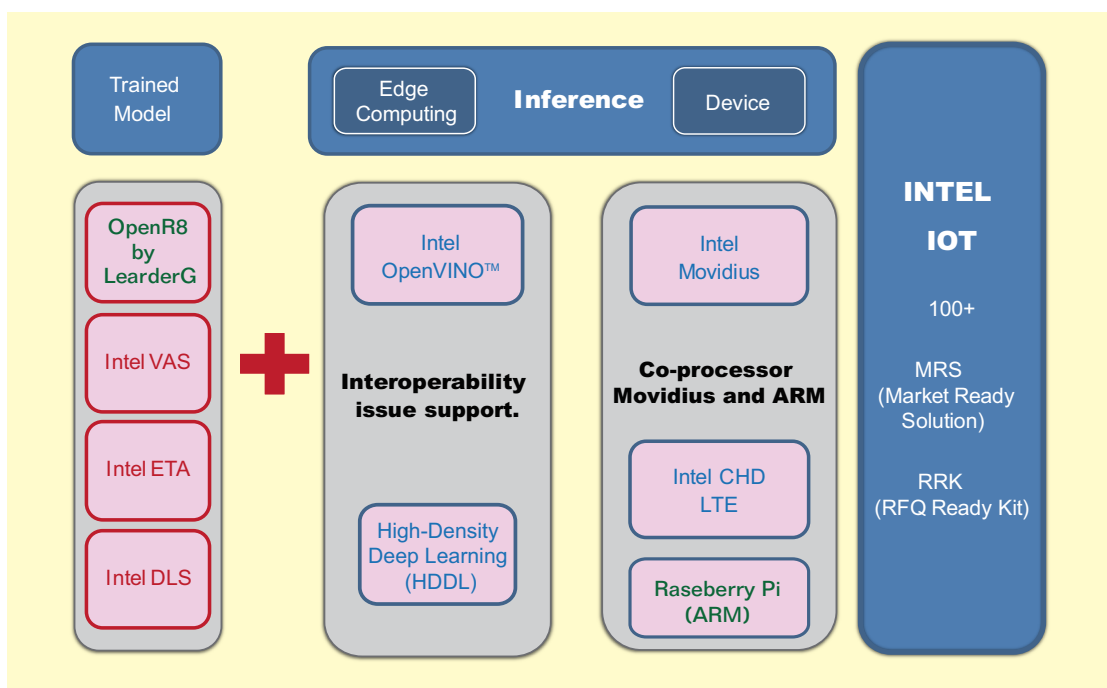
AI development targeting the large scope of applications can hardly be satisfied by a CPU chip and toolkit. Additional resources across different industries need to be pulled together, forming a complete ecosystem to be able to meet market demands. Based on WPI’s observation, system developers with AI development needs can be categorized into four types and all of their needs can be fulfilled with Intel’s solutions and WPI’s services.

System integrators in specific fields have specialized knowledge but lack sufficient resources to build AI systems. They need ready-to-use AI solutions, which, when combined with their own know-how, can go to market. For them, there are system developers already creating modular products for specific fields using Intel’s Market Ready Solution (MRS) or RFP Ready

Kit. In this scenario, WPI plays the role of an industry ecosystem aggregator bridging the supply and demand side.

System developers in the second category look to upgrade their finished products by adding specific AI functionalities without altering the original architectures and devoting tremendous resources. For these system developers, Intel® Movidius AI processors can help them achieve product upgrade with minimum costs and architectural changes.

System developers in the third category hope to augment their x86 platforms with additional computing power. They mainly develop industrial control systems that are used in a diverse range of application scenarios. A single system design can hardly meet wide-ranging customer needs but providing a tailored design for each individual customer will be too costly. To strike a balance, most system developers will come up with a basic design that satisfies a majority of market demands and leave room for flexibility to accommodate customers’ special requirements when necessary. With Intel® High-Density Deep Learning (HDDL) acceleration cards and OpenVINO™ toolkit, they can increase computing power by adding expansion cards without altering the original architecture, thereby saving the costs of having to redesign the system.



WPI provides value-added services for customers using Intel® AI Vision and Intel® OpenVINO™ solutions.



System developers in the last category aim to incorporate AI into their existing systems in a snap. AI consists of two phases – training and inference. An AI module needs to be trained at the front end so that a model can be built. Then, the AI module can be integrated with the existing system, which is then suited to the original targeted application to become a smart system. Take manufacturing inspection for example. Front-end training enables the AI module to assess the quality of a product. The trained AI module can then be integrated with the existing production equipment and put to use on the production line, which becomes smart with AI-based inspection.

However, front-end training requires strong computing power for the execution of complex algorithms as well as specialized know-how so that an accurate training model can be built. WPI offers an AI training platform, which is powered by Intel® CPU and HDDL acceleration cards. To accommodate wide-ranging applications across different fields and scenarios, WPI's AI training platform also comes with the OpenVINO™ toolkit, which supports the development of training models for specific uses. Apart from offering the AI platform based on Intel® products, WPI also works with firms across industries to help them incorporate AI to boost production efficiency. For example, to make production more efficient for the manufacturing industry, WPI has collaborated with automated optical inspection software developer LeaderG to use its OpenR8 AI software to train and equip production machines with image recognition capabilities, thereby enabling them to conduct AI-based inspection.

WPI repositions itself as an aggregator bridging supply and demand

People working in the industries and the general public are mostly under the impression that AI systems must be very powerful and therefore require enormous computing power. However, from the above discussion on the four categories of system developers, we can see that different AI applications require different architectures and levels of computing power. For example, self-driving cars need their AI systems to have network capabilities to communicate with back-end cloud platforms so that they have access to all information on the road. Product inspection systems or face identification on home devices, on the other hand,

only require their front-end nodes to do simple image recognition with no need to communicate with back-end platforms so they are not resource hungry. WPI can help customers develop their own AI systems to suit different types of applications.

WPI's strategic planning and service portfolio indicates it is undergoing a transformation in the role it plays in the marketplace amid the rising AI trend. This is not the first time that WPI makes a change but in fact WPI has constantly been repositioning itself in response to market shifts. WPI began its business as an IC distributor, selling electronic devices of various brands. Later on, with applications becoming growingly diverse and FAE demand emerging, WPI started to help customers strengthen their abilities to make use of IC devices. In recent years, the market favors total solutions so WPI endeavors to combine its offerings and provide turnkey solutions for customers. Now embracing the upcoming AI era, WPI is again transforming itself to become a solutions aggregator.

IC devices have generally been used in consumer electronics, such as notebook computers and mobile phones, with which customer requirements and applications have been straightforward. In the AI era, the list of industries that can incorporate AI is endless, encompassing manufacturing, healthcare, transportation and retail, just to name a few. However, these wide-ranging applications each only have a small demand. As such, big firms like Intel® will not offer a specialized product targeting an individual application so Intel® chooses to offer MRS and RRK solutions, which are semi-finished architecture platforms for system developers to add their own designs and build tailored products. Intel® also offers a match-making platform where system developers can advertise their tailored products to attract businesses that may have needs for them, helping put these products to actual use.

WPI, as an aggregator, combines Intel® products into solutions suitable for different fields. Then, by leveraging its long-established operation channels throughout different regions and industries, WPI matches the solutions with appropriate system integrators or end users in need of such solutions.

Many startup companies are working on IIoT and AIoT architecture developments. Some of them may be small

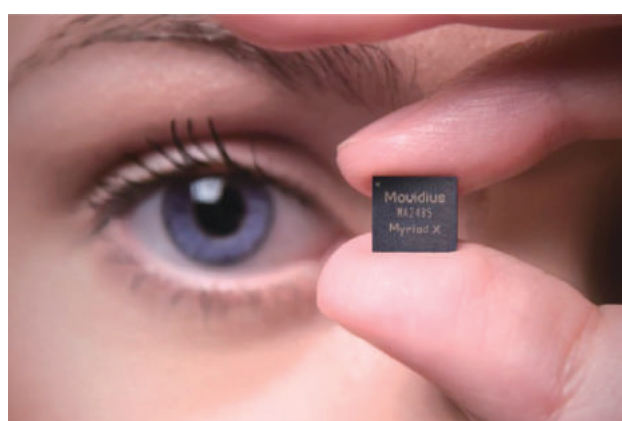


and unnoticed but their products have great potential. As these startups may have limited resources to market their products around the world, WPI can help their products gain exposure on worldwide markets. Being an Intel® IoT Solution Aggregator focusing on Asian markets, WPI began to hold match-making events in Malaysia and Thailand in 2018. In 2019, WPI is expanding its efforts to India with a strong software sector, in hopes of finding opportunities to introduce AI to India's local industries. To startups with inadequate labor, resources and experiences, WPI presents a very effective way to market their products. This is also WPI's unique advantage built up through years of devotion into different market segments.

With compelling product advantages, WPI helps customers grab market opportunities

By combining its industrial experiences with Intel® platforms, WPI bridges together AI supply and demand. To embrace burgeoning AI and IoT opportunities, there are match-making platforms other than Intel's on the market. However, Intel® offers advantages that the others cannot match.

First of all, Intel's MRS and RRK sales channels expand product presence and boost exposure. As to cloud platforms, Intel® has announced the plan to initiate cloud services in 2019. Last but not least, Intel® CPUs are already based the most popular x86 architecture. Starting from the 6th generation, Intel® processors come with built-in GPU and half of its 9th generation CPU have integrated graphics chips. In Intel's design, CPU and GPU can run simultaneously and can be upgraded to have AI capabilities on the OPENVINO™ platform. In the case that more



Intel® Movidius Myriad X

computing power is required, Intel® acceleration cards can be added to support execution of complex algorithms.

With more applications in actual use, AI is not only growingly popular among industries but has become a must-have for businesses that look to strengthen their competitive edge. Both system developers and end users have to think about how to incorporate AI. From the technological perspective, AI development is mature enough to be applied across different industries. System developers and end users only need to add their ideas and creativity and then they can bring their AI applications to reality. WPI, playing the role of an aggregator in the Intel® ecosystem, will serve to connect supply and demand and fill the gap caused by the lack of sufficient information and resources in the past. Going forward, WPI will continue to expand the ecosystem and leverage Intel's and WPI's professionalism in the respective fields to help customers find the market for their products and secure market presence amid the AI trend.

For more information on Intel aggregators, Intel MRS, Intel RRK and Intel OpenVINO™, please visit the following links:

- Intel IoT Solution aggregator
- Intel MRS (Market-ready-solutions)
- Intel RRK (RFP Ready Kit)
- Intel OpenVINO™ (Open Visual Inferencing and Neural Network Optimization)

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