

This handheld device can tell you if the fruit is ready to eat. PG / 08

*The*  
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**Empowering enterprises  
to bridge the gap between  
machine intelligence and  
human thinking:**

**Loop AI Labs**

*GM Calafiore, CEO & Founder*

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# Cover

*"We call ourselves Homo sapiens—man the wise—because our intelligence is so important to us. For thousands of years, we have tried to understand how we think: that is, how a mere handful of matter can perceive, understand, predict, and manipulate a world far larger and more complicated than itself. The field of artificial intelligence, or AI, goes further still: it attempts not just to understand but also to build intelligent entities."* - STUART J. RUSSELL & PETER NORVIG, Artificial Intelligence: A Modern Approach

**I**n 2015, research from IDC revealed that enterprise businesses can't see 90% of their data, because its format is not tabular and is therefore dark to computer analysis. Recent years have seen an explosion of such "dark data": Unstructured data that includes text, images and speech in multiple formats and languages.

But in 2012—several years ahead of the official recognition of the giant potential of a Cognitive Computing Market by major industry analysts—GM Calafiore, Bart Peintner, PhD, and Patrick Ehlen, PhD, saw how this information inflation would cripple knowledge workers who

wouldn't be able to keep up with learning and research to keep in step. The shear rate at which information now expands in a year for any given domain is often so great that it creates a massive gap between the performance of experienced workers and that of the less-experienced, even when they are aided by the most cutting-edge technologies. Traditional artificial intelligence, they realized, approached these problems through methods of learning and decision-making that were very different from the methods actual humans might use to learn or decide when faced with the same tasks. So they set out to build a "Human Capacity Cognitive Computing" platform, integrated in hardware and software, which would emulate

*"We envision a world where cognitive services and products will transform our workplaces and personal lives—automating the mundane, anticipating relevant information and connections, and allowing more time for leisure and creativity. Our mission is to turn any organization into a thinking business by embedding in their product and processes a cognitive system that autonomously understands and reasons at scale on the dark data generated by the people and things that are specific to each organization."*

**GM Calafiore, CEO & Founder**

**Empowering enterprises to  
bridge the gap between machine intelligence  
and human intelligence  
Loop AI Labs Cognitive Computing**

# Story

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to bridge the gap  
ence and human thinking:  
gnitive Computing

“We combine our rich, sophisticated, artificial intelligence heritage with new architectural advances to ensure the Loop Cognitive Computing Platform runs autonomously and as fast as possible—even in huge enterprise environments that span the globe. Loop AI Labs intends to help major sectors of the economy—such as aerospace & defense, automotive, banking, healthcare, media, oil & gas, power & utilities, technology & telecommunications, and retail—to benefit from the efficiencies of a new era of cognitive technology, and to make people’s lives easier, safer, and more productive.”

the learning and thought processes of humans by articulating many disciplines of science and technology—including AI, linguistics, psychology, and supercomputing—in order to enhance and scale human expertise.

After a few years of experimentation, research and development, they rolled out the Loop Cognitive Computing Platform, the first commercial release of the platform, specialized in learning, understanding and reasoning on any kind of dark data expressed in any human language. Since then, there has been no looking back for the company!

### **Transformative Potential:**

*“In this case, the phrase ‘quantum leap’ is not hyperbole. The increase in real-world functionality that full-scale cognitive computing can achieve is almost incalculable. From autonomous vehicles to near-human virtual workers, the world will look very different after this paradigm shift.”*

Jim Lundy, Lead Analyst and CEO of Aragon Research, in a February 2016 research note.

IDC estimates that the market for Cognitive Solutions will exceed \$40 billion by 2020, with a CAGR of 42%, led by a small number of cognitive software vendors among representative suppliers like IBM, Microsoft, Intel Saffron, Google, and Loop AI Labs.

## **Helping machines understand the human world**

The Loop Cognitive Computing Plat-

form is a core component for the Digital Transformation program of any organization that needs to compete as a thinking business.

The Loop Cognitive Computing Platform automates the processing and understanding of dark data that is unique to each organization by quantifying, organizing and extracting relevant language and knowledge about a topic or discipline. The platform learns on its own, reasons on its own, and allows any organization to use cognitive understanding in every aspect of their digital operations by embedding Human Capacity learning and reasoning in their traditional human-driven processes.

***“By 2018, over 50% of Enterprises will cognitively-enable some of their processes with \$60+ Billion annual savings.”***  
- IDC 2016

The Loop Cognitive Computing Platform works on principles inspired by the neocortex, the brain’s center for language and reasoning. Loop AI’s home-grown algorithms learn the underlying structure and concepts within each organization’s dark data, including documents, emails, web pages, social media, conversations, chats, customer feedback, reviews, books, and soon images and audio. Unlike its competitors’ offerings, Loop’s Cognitive Computing Platform does not require human guidance or labelling, domain- or language-specific programming, or pre-defined dictionaries. Loop AI Labs has the first-mover advantage in offering a

cognitive computing platform with a fully unsupervised approach that allows current customers to implement cognitive applications in their specific domain within weeks—instead of several months or years—augmenting human judgement, recommending practices and courses of action, and automating human-driven, knowledge-based processes.

While conventional computing systems are programmed using rules and dictionaries, the Loop Cognitive Computing Platform leverages Human Capacity understanding and iteratively learns any language (including Arabic, Chinese, Japanese, Korean, or local dialects in any language) and concepts particular to a domain directly from source data much like humans would, without prior knowledge of the syntactic or semantic structure of the language.

***“Knowledge work will be fully automated” and “organization processes with intellectual requirements will be converted to cognitive software by 2025”*** - Gartner 2016

While competitors today settle for public cloud-based API technology offerings, Loop AI Labs envisioned a different opportunity. Talking about why the company decided to embark on this new unexplored journey of founding an unsupervised cognitive computing platform (HPC Appliance or embedded in a fleet of devices), GM Calafiore, the company CEO, said, “After the launch of our commercial platform at the Deep Learning Sum-

mit in Boston in June 2015, a foundation that we've been building for many years, I realised that most companies do not want their dark data to leave their data center, both for privacy and performance reasons. And in the IoT world, cloud is usually not even an option considering the huge number of devices that often need to process data offline, due to unreliable or unavailable network coverage. So we partnered with NVIDIA and set up an on-premise integrated hardware and software High Performance Computing (HPC) appliance, initially based on GPUs, to automate tasks that tradi-

tionally require human intelligence, such as planning, reasoning from partial and uncertain information, and learning from dark data, while the customer's data never needs to leave their data centre. Our appliance runs our proprietary unsupervised learning algorithms in parallel on thousands of cores within the same customized hardware, enabling large organizations to scale the learning and reasoning capabilities on their dark data and create cognitive applications that help their employees in many departments". Indeed, today Loop AI's cognitive computing platform can

understand links and languages better than anyone else can. In a Loop AI Labs customer case study, 18 minutes of runtime on the Cognitive Platform appliance did the equivalent work of 4,000 hours of employees' intellectual time.

Since inception, the company's talented executives have been working around the clock to radically change how machines can autonomously learn and understand the human world, mirroring the same learning process that humans use.

## Taking Loop AI Labs to the pinnacle of success

*"When we started this company in 2012, little did we know that 'Deep Learning' (a kind of machine learning) would take the world by storm in the years to come. We made a choice back then to invest in Deep Learning research and worked hard to develop the algorithms and techniques that are the foundation of our cognitive computing platform. It is exciting and gratifying to watch the system learn on its own—directly from raw data, and without supervision—from text in languages I personally cannot understand."*

said Dr. Peintner, CTO of the company.

In just a few years, Loop AI Labs has indeed taken the IT market by storm, by offering one-of-a-kind solutions that are not only affordable, but also flexible, tailor-made, and an asset to any user. The company has seen tremendous growth, and today make their presence felt globally with offices in the USA, Europe, and Asia. From 2015, the Loop Cognitive Computing Platform is an official player in the Cognitive Software Market, recommended by almost all the major industry analysts, and awarded dedicated reports from Ovum (On the Radar Report) and from IDC (IDC Innovator Report).

Bart Peintner,  
CTO





Patrick Ehlen,  
Chief Scientist

## In conversation with Dr. Patrick Ehlen, Chief Scientist

**Q. Tell us about the executive team's experience while setting this company up?**

**A.** In the mid-2000s, Bart and I both worked on one of the most ambitious AI projects in history, the DARPA CALO project. It was a large, multi-institution project, with many of the smartest minds in AI, but also a lot of cooks in the kitchen. So we learned a lot about how to do AI, but also about how NOT to do it. When we came together to develop the technology for Loop AI Labs, we were very focused on creating a lean and versatile system. Think of Craig Venter's "shotgun sequencing" approach to genomics in light of the giant Human Genome Project of the time. We also brought a lot of expertise from other projects, as Bart was instrumental in some great personalization work at SRI, and I worked on a number of projects around multimodality, which involves fusing together different types of information, such as speech and gesture, into a semantically-coherent whole. All of these experiences were instrumental in helping us to design an integrated Cognitive Computing Platform based on human capacity that is also able to scale to the needs of large business organizations.

**How has Loop AI Labs' journey been so far in the quest for excellence?**

**A.** Our first cognitive application to test our platform was experimentally launched at a Beta Track of the Web Summit where we were invited in November 2014 in Dublin, Ireland, which featured only a few companies in this category. The companies in the Beta Track were selected based on their display of true innovation and business acumen, and we decided to make the most of this opportunity by launching the company out of stealth mode while being amidst fellow IT decision-makers. This two-in-one-opportunity proved to be more than just fruitful for us. We networked with so many peers and learned valuable lessons from executives of larger companies that were essential for the launch of the Loop Cognitive Computing Platform in June 2015. It was then that we realised that Fortune 100s were the most interested in our platform and would be the ideal target-audience for Loop AI Labs. We haven't looked back since.

## In conversation with GM Calafiore, CEO

**Q. There is a space race in AI amongst different organisations today. Does Loop AI also have a competitor?**

**A.** As Heraclitus told us more than

two-thousand years ago, change is the only constant, and of course there are going to be competitors. Currently, IBM Watson (the on-premise version) and IP Soft are the solutions that our clients and potential clients in Asia, Europe and America talk about most, but differ from our offer in terms of total deployment cost, speed of deployment (weeks instead of many months) and

maintenance costs in terms of the manpower needed to continuously supervise domain-specific learning in each specific language. Aside from the advantage of our unsupervised platform in that regard, our system needs minimal monitoring and intervention from individuals, as our algorithm is capable of functioning smoothly without human supervision.

The current customers who have cognitively-enabled their processes have, in many cases, registered a step increase of revenues, and at the same time a huge cost decrease or productivity improvement.

## ***How do you plan to stay ahead of them and remain as a winner in this competitive market?***

To stay ahead of the competition, we are working on the next generation of the platform both on the hardware and software side. The next generation of the Loop Cognitive Computing Platform, a free appliance upgrade for all our customers, will be multi-modal, meaning that it is capable of doing concurrent learning and reasoning from language, vision, hearing, and

other types of sensor data, using a next-generation, tailor-made proprietary hardware that will run faster than our current GPU appliance.

## ***Q. As pioneers of cognitive computing technology, how did you decide upon which business industries to target for building a strong client base?***

**A.** A cognitive software platform is a core platform that enables organizations to leverage 100% of their data, whatever its format (10% tabular data used by current analytics and 90% of dark data) to solve many difficult problems in many different industries. We focus on providing and maintaining a cognitive software platform,

and to build cognitively-enabled applications we rely on a network of Certified Partners that are already working with our target Fortune 2000 clients and are familiar with their problems and IT environments. With this approach, we serve a variety of clientele in Asia, America and Europe, that spans across the entertainment, media, telecommunications, mobile manufacturer, automotive, healthcare, and retail sectors, and also largely the legal and paralegal services sector. Currently we are certifying several dedicated teams within the largest consultancy and integration companies in Asia, Europe and America with the goal of having several hundreds of dedicated Loop Certified Professionals building cognitively-enabled applications for the largest companies in every region.

Founded in 2012, Loop AI Labs' scientific and engineering team has a long history of experience in researching and implementing artificial intelligence in organizations such as the Artificial Intelligence Center at SRI International (founded as Stanford Research Institute) and Stanford's Center for the Study of Language and Information (CSLI), including participation in the \$200M DARPA CALO project (Cognitive Assistant that Learns and Organizes), the largest government-funded artificial intelligence project in history. Every member of the executive team has at least two decades of experience in their respective fields.

## THE LOOP AI LABS ADVANTAGE

### ***What are the three key strengths of the Loop Cognitive Computing Platform?***

**Language-independent, real-time unsupervised learning and reasoning:** This key feature enables the automatic assembly of a complex knowledge model automatically created without any human supervision, labelled data, ontologies, or dictionaries from data specific to each organization. This feature also enables the Loop Cognitive Computing Platform to be language-independent (understanding any dialect or language including Chinese, Japanese, Korean and Arabic), which is extremely important for organizations with a global reach—or for the ones who need to understand spoken language with all its variations and errors that don't conform well to perfect grammar or a standard dictionary.

**On premises deployment:** Loop AI Labs is ramping up its core business with the on-premise deployment via a plug-n-play high performance computing appliance (HPC). For some cognitive applications, the cloud cannot accommodate the velocity and volume of dark data. For other cognitively-enabled applications, the cloud is sub-optimal because of the limited performance and availability of cloud GPUs. Even for use cases where these limitations are acceptable, there are often concerns about privacy and security of the data leaving the premises.

**Subscription model:** Customers have the option of renting the Loop Cognitive Computing Platform appliance (hardware and software) and scale up or down depending on their needs. E.g., they can rent multiple appliances for a limited time to create a cognitive application that relies on historical data. Real, actionable Loop Cortexes to create cognitively-enabled applications can be obtained and deployed within weeks of delivery.