



SANDSIV VOC HUB – CUSTOMER EXPERIENCE MANAGEMENT 2.0



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Gartner, the global research and market analytics company, has stated that, “A new era of customer relationships, in which customers are the new employees, and have a voice that needs to be listened to, respected and acted upon, will be unavoidable for the vast majority of organizations over the coming decade. VoC-focused technologies will become critical investment areas for many organizations during the next five years.”

Companies are capturing ever increasing volumes of data. Yet they are failing to extract value from this data. Typically, customer knowledge, including the Voice of the Customer across all three voices (direct, indirect and inferred), is stored in separate data silos, and actioned using disconnected systems.

This means that the company is missing out on the opportunity to receive a truly 360 degree view of the business, and the relationship it has with its customers. What is needed, is an entirely new way of unifying all streams of customer knowledge, one that can store and analyze the full range of both structured and unstructured data, and perform real-time analytics, to produce actionable customer intelligence.

The Evolution of CRM

In the modern commercial arena, buzz

words and acronyms abound. Often overlapping, and making the navigation of available technology difficult. The acronym CRM (Customer Relationship Management) is one such acronym that has been with us for some time. Most companies use a CRM system to manage the relationship with their customers. So how is VoC technology different to CRM?





In its most basic form, a CRM system stores customer information such as contact details, sales history, contact log and segmentation data. CRM have been in use for many years, with good success, but they can only provide an inside-out view of the customer experience. Put simply, they can only provide a view of the interactions

and relationship with a customer, from the perspective of the business. This inside-out view of the customer relationship is gathered over time, and can be used by decision makers to drive strategy, based upon best judgment.

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In complete contrast, Voice of the Customer and Customer Experience Management applications, enable a company to receive an outside-in view of its customers and market. VoC technology can be used to capture feedback across the entire customer journey, from pre-purchase, through sales transactions, support enquiries, and indeed, the entire customer lifecycle.

CRM versus VoC from a Customer Management Perspective

So now we know the difference between CRM and CXM/VoC, can we answer the question, which is best for managing the customer experience? Yes we can, we know that CRM is primarily a vehicle for maintaining records of transactions and interactions between the company and the business. We know that CRM can only deliver an inside-out view of the relationship between the company and its customers. And we also know, that VoC technology can give us more, delivering the outside-in view. What we end up with, is a 360 degree of the customer, and its interactions with the business. In effect, CRM, or at least the technology behind it, becomes a subset of Customer Experience Management.

By implementing Voice of the Customer driven systems, the company gains the ability to capture, analyze and visualize customer feedback in real-time. This customer feedback can be instantly turned into customer intelligence, and then disseminated across the enterprise, turning the Voice of the Customer into a driving force behind the actions and strategy of the business.

A feature rich Voice of the Customer platform can ensure that the company understands the root issues behind all customer feedback,

both positive and negative, and exploit real-time insights to deliver a strategic and tactical advantage. This capability to identify risk, by correlating customer and financial data, empowers the company to allocated short-term resources and respond to customer needs in an agile manner.

However, responding to customer needs in the short-term, effectively closing the loop, is only a marginal benefit of VoC driven technology. By far the greater benefit is when customer feedback is used intelligently to drive business decisions, changes to business processes, and the corporate culture adopted by customer facing employees.



The Customer has Three Voices

Ask yourself the question, does my company really understand the power of the voice of its customers? Many companies do actively try to understand the needs and wants of their customers, but very few actually have access to a completely 360 degree view of the customer relationship.

This is most usually caused by the fact that the company lacks the technology and tools to listen to each of the three distinctly different voices the customer will use. These three voices are the direct voice, the indirect voice and the inferred voice. An inside-out view of the customer relationship, typical of that derived from the use of solely CRM, can only ever capture the direct voice of the customer. So let's take a look at all three voices, and some of the touchpoints they can be captured across.

The Direct Voice of the Customer

The direct Voice of the Customer is exactly as the name suggests, any touchpoint where the customer is interacting directly with the business. Typically, the customer will be

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expecting the company to be listening, and also potentially making some form of reply.

Such touchpoints could include pre-sales questions such as pricing, contact with call center staff, or a billing department to resolve issues, and any other touchpoint where the customer is communicating with the business in a one to one fashion, regardless of communication channel.

As previously mentioned, CRM can only manage the direct Voice of the Customer. In order to move forward from this restricted state, a company needs to begin investing in VoC/CXM technology that can do more. Technology such as the SandSIV VoC Hub that can begin to deliver the aforementioned 360 degree view of the customer relationship.



The Indirect Voice of the Customer

When we talk about the indirect Voice of the Customer, we mean all of those times when the customer is talking about the company/brand/product, but is not directly communicating with the business.

For example, a customer may make a comment (either positive or negative) about the company on a social networking site such as Facebook, Twitter, LinkedIn or Google+. This comment will be viewed by the customer's peer group, and could well have an effect upon the company.

Any time that two parties that are unrelated to the business have a discussion, then we have the possibility to capture the indirect voice of the

customer. VoC technology can provide the vehicle for capturing this valuable stream of information, going far beyond the limitations of CRM.

The Inferred Voice of the Customer

The final voice, the inferred voice, is the most complex of the three voices to conceptualize. The inferred voice is constructed from a combination of historic VoC data (and this includes both the direct and indirect voice), by performing predictive analytics.

The inferred Voice of the Customer spans every communication channel such as SMS, email, web chat logs, transcribed call logs, social networking comments, absolutely every possible form of communication, across every conceivable touchpoint.

In simple terms, we are using all available historic VoC data, to predict what the customer will say about the company in any definable circumstance, using predictive analytics.

The ability to listen to, and act upon, each of these three voices, is what gaining a 360 degree view of the customer relationship is all about. Only by taking each of the three voices into consideration, can we drive business changes in a holistic fashion.

One Platform to Manage Them All

There are so many vendors promoting what they purport to be Voice of the Customer or Customer Intelligence platforms, that there is now some confusion over exactly what these kinds of solutions should deliver in the way of features.

Let's try and clarify this issue and come up with an answer, by first listing what a VOC platform is not. A VoC platform is none of these:

- A CRM system.
- Analytical tools for extracting information from a CRM system.
- A Customer Feedback Management (CFM) solution.
- A Sales campaign management solution.
- A social media monitoring application.
- A social CRM.
- A Business Intelligence application.
- A data mining tool.
- A sentiment analysis tool.

A Voice of the Customer platform is none of these things, but it can be used to support each of them. Why is this so? If we consider the needs of the business, and what it requires to build a competitive advantage

based on customer insights, then a true 360 degree view of the customer relationship can deliver the same results as many other, disassociated systems.

The kind of Customer Intelligence that that SandSIV VoC Hub can provide, gives the business a highly detailed understanding of the experience that its customers have, when interacting with the company. This enables predictive analytics to begin uncovering many of the reasons that drive customer behavior. These insights can then be actioned to deliver a much more effective way of making strategic decisions.

The Benefits of the SandSIV VoC Hub

The SandSIV VoC Hub provides an end-to-end Customer Experience Management solution that provides all of the major benefits of adopting a VoC solution that have been outlined so far. A non-exhaustive list of benefits could include the following:

Forming a Bridge between Customer Satisfaction and Financial KPI

A happy customer is not always the most profitable customer. Part of the goal of any Customer Experience Management program should be to tie customer behavior into financial KPI, so that the business can leverage the best return on investment for each customer.



Financial KPI such as account profitability, share of customer wallet, average order value, and all of the other financial metrics that companies use, can be correlated with customer sentiment and satisfaction, at a highly granular level.

By understanding the customer relationship at such a deep level, the business can begin to develop a strategy of moving from a purely product focused, to a more customer driven way of working. However, there is a potential pitfall that companies need to overcome to facilitate this change in operational focus.

Three specific elements need to be aligned to successfully move towards a more customer centric way of working, based upon financial KPI correlated with the customer experience, and these are:

- The correct metrics will need to be chosen.
- Data will need to be captured at a level of granularity that can provide sufficient results after analysis.
- Implementation will need to take into consideration segmentation and the method used for sampling data.

Bring Social Media into the Customer Relationship

The SandsIV VoC Hub turns social media into a powerful strategic source of customer knowledge. By integrating social media with other channels of customer data, a company gains the capability to move beyond purely reactive customer interactions.



By gaining the ability to take indirect opinions of customers, and bring them around to an off-line interaction, such as a private chat session or even a follow up call, the company is able to prioritize which indirect interactions need to be escalated.

Become Much More Proactive

For a business to become fully proactive in its dealings with its customers, an investment in technology such as the SandsIV VoC Hub is required. This technology will empower the business to begin gaining actionable insights into the customer experience, by analyzing multiple streams of unstructured data.

Aligning Operational Information with Customer Feedback

Even simple customer feedback tools such as customer surveys, can highlight potential business changes that can be driven by customer wants and needs.

Furthermore, key operational KPI such as First Call Resolution (FCR), and customer satisfaction, can be aligned realistically with actual customer metrics at a highly granular level.

Gaining an understanding of how existing operational KPI actually align with real customer metrics, will enable the business to make short-term actions, to fix issues that negatively impact the customer experience.

From CXM to CI – Access Limitless Insights

Many of the benefits that were listed in the previous section, rely upon the adoption of generated Customer Intelligence to drive business change. However, so that we can see the true benefits of Customer Intelligence, it would be useful to define what it is more clearly.

What is Customer Intelligence?

Customer Intelligence is an exciting new technology that is enabling an entirely new business methodology, driven by customer insights gained from performing analytics and classification on customer data.

We have had business intelligence platforms for many years that can summarize and conceptualize financial data, helping decision makers to define strategy.

Customer Intelligence, in a similar way, gives a company a view of customer relationships, based upon all available customer data that can be correlated against key company KPI, both financial and operational. CI delivers an understandable picture of the customer experience, and how it affects the business. This could include things such as retail store performance, customer churn rate, product advocacy, and indeed, any metric that customers generate. On top of this, CI shows how all of these indicators combine and connect.

As additional layers of customer data are added into the equation, such as social networking monitoring, loyalty program performance, web analytics and every other conceivable source of customer data, things become incredibly difficult to integrate and analyze. This is where the SandSIV VoC Hub

excels. It takes all of these data sources, and turns them into a single silo of potential Customer Intelligence.

The difficulties aside, it should be evident that Customer Intelligence can lead to a significant competitive advantage in any market. It can also empower the enterprise to drive marketing, product development and customer service based on real-time insights.

So why is the SandSIV VoC Hub better at producing Customer Intelligence than other, older types of solutions? The SandSIV VoC Hub is a true Big Data application, able to take information for any source, in any form, and turn it into a single data silo, with no need for data modeling.





There is No SQL just NoSQL

At the heart of the SandSIV VoC Hub lays a technology stack that is based upon NoSQL. NoSQL combines a range of database technologies, originally developed to facilitate the easy storage of increasing volumes of data, about users, objects and products. NoSQL was specifically designed to facilitate frequent access of this data, at peak performance.

This is an improvement over older relational databases, which struggle to cope with the agile access and processing

of massive amounts of unstructured data. Additionally, relational databases do not scale well, and historically do not exploit the kind of processing power and storage capabilities that we have access to today.

The Benefits of NoSQL

NoSQL offers some significant benefits over traditional relational databases when it comes to storing and accessing the kind of data we need to silo, in order to develop a robust, scalable and high performance VoC platform. These benefits can be summarized thus:

- The ability to store very large volumes of both unstructured and structured data.
- Streamlined development through agile methodology including sprints, rapid iterations and frequent code pushes.
- Flexible object orientated coding.
- Scalable architecture, lowering expense.

No Data Modeling Required

Older relational databases require data to be stored in a strict format, a format that needs to be defined in advance. For example, if we wanted to store basic customer data, we would need to define a format (schema) that included fields such as name, address, telephone number, etc. We would need to strictly define the length of each field, the content type and other fixed criteria.

So when we are attempting to capture and store masses of data from multiple sources, all in different formats, there is a vast amount of work required just to set up the various databases, indexes and relationships. This constant redefining of database schema quickly becomes unmanageable when we are talking about capturing such diverse data streams as discussed above.

There is also a major problem with database performance, when traditional relational databases reach a certain size. They do not scale well, and do not take advantage of modern distributed storage and processing technology.

NoSQL works in an entirely different way. NoSQL requires no ready defined schema to enable it to store data. We simply dump data in any format into the NoSQL database. This of course, vastly reduces development overheads, we also minimize service disruption, as each new data stream we add to the database does not require changes to the database structure, which in turn, would result in downtime whilst the update is applied.

In a nutshell, NoSQL does away with the need for extensive database administration, and speeds up development times significantly.

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Distributed Storage

Relational databases do not scale well, as we have previously mentioned. Most usually, the database will be stored and accessed from a single server. When more storage space or processing power is required, then the server needs to be upgraded, or potentially replaced entirely. This also means that fault tolerance is difficult to implement. This type of horizontal scaling can become very expensive over time.

There is a way to overcome this problem with relational databases, by clustering servers into groups that share the load. However, this is still tricky to implement with a relational databases, and although it does work, it is not an elegant solution, it still requires a large investment in resources to implement and administer. This will include the actual development of code that queries the now distributed data, as database queries will need to be developed specifically for running in a clustered environment.

NoSQL overcomes this problem by exploiting the power of automated distributed storage. We call this “sharding”. This means that out of the box, NoSQL will automatically spread data across all available servers. The application accessing the NoSQL database is not even aware of this, it is all handled seamlessly by the

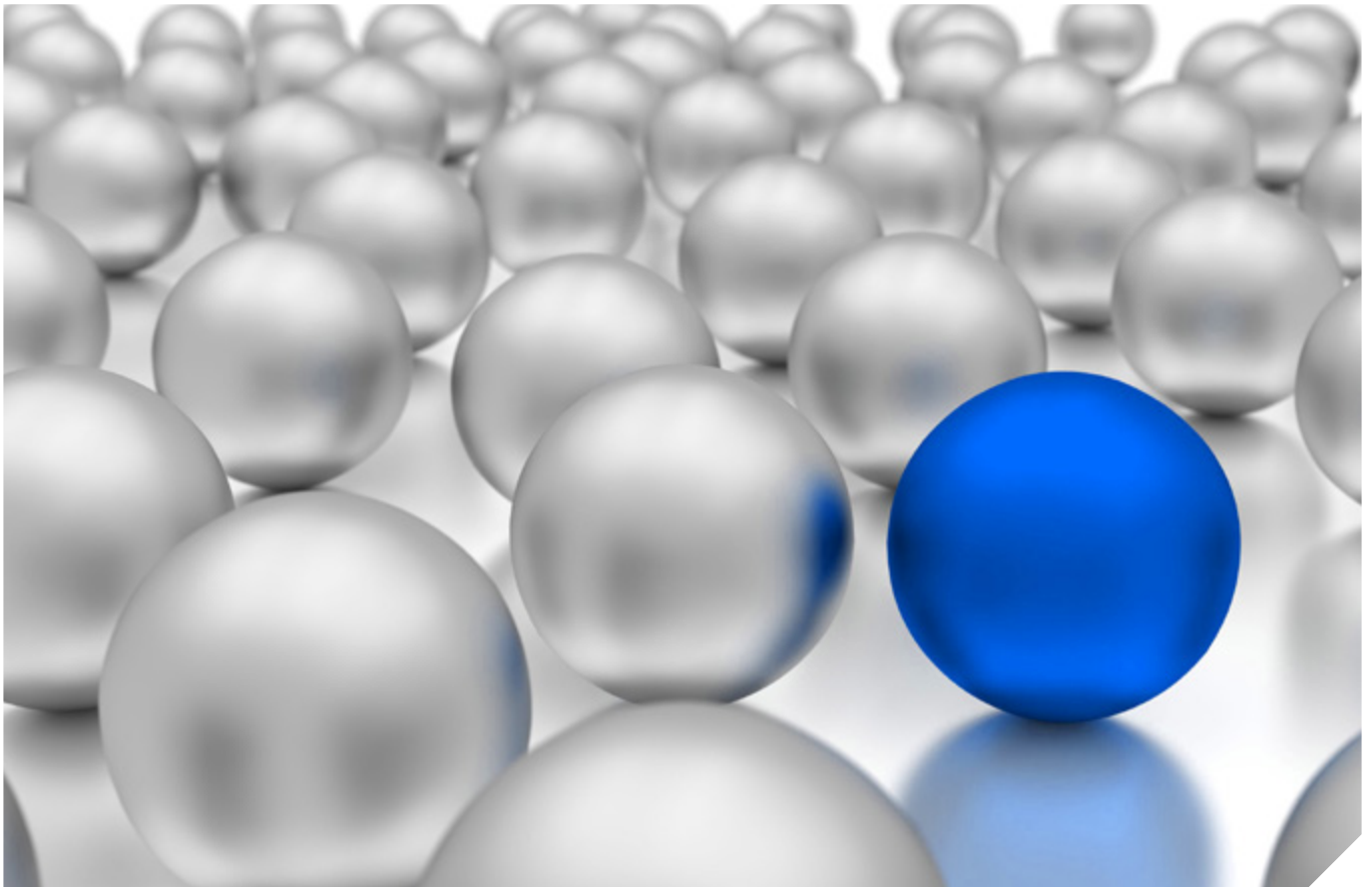
database server. This in-built capability also includes automatic load balancing, ensuring that processing resources are used equally across each shard. This also means that NoSQL has active fault tolerance and redundancy when working in a sharded environment. Once again, this is automatically exploited when NoSQL is split across several shards.

By leveraging the value of cloud storage solutions, such as Amazon Web Services, NoSQL storage requirements can also scale on demand. Again, this is an automatic process that requires no administration.

Replication and Redundancy

NoSQL databases provide a framework for automatic replication. This means that full redundancy becomes available, with zero overhead in administration, such as performing backups and restores. In effect, NoSQL will clone the entire database, and keep both copies in sync at all times. This provides the ultimate in failover recovery.

“NoSQL exploits the power of automated distributed storage, automatically spreading data across all available servers.”



Exploiting Caching Technology

There are a number of available options for implementing resource caching of NoSQL databases. This technology can significantly improve the read performance of databases queries. However, it should be noted that they do not improve write performance. Even so, the performance benefits for most applications that perform even an average number of reads are quite impressive. Caching keeps frequently accessed data in system memory, and there is no requirement to access physical storage when this data is read.



NoSQL versus SQL Summary

	SQL Databases	NoSQL Databases
Types	Single type with minor variations.	Many types that can include graph databases, wide-column stores, document databases and key-value stores.
Development History	Initially developed in the early 70s, no major innovation since this time.	Developed in 1998 with the goal of overcoming limitations with relational SQL driven databases including scaling, replication and handling unstructured data.
Examples	Oracle, Postgres, MySQL, MSSQL.	MongoDB, Cassandra, HBase, Neo4j
Data Storage Model	<p>Based on record driven scheme, reliant upon a row/record architecture.</p> <p>Individual fields need to be defined within each record. For example, customer name, customer number, customer address.</p>	A variety of data storage models are available, including relational style key/value columns, and document databases that entirely remove the requirement for any schema.
Schemas	<p>Query time joins happen in real-time using SQL statements. For example, recalling customers who purchased a certain product.</p> <p>Customer data would be stored in one table, purchase transactions in another. An SQL statement would produce a query that joined these two data sources at run time using unique keys.</p>	<p>Most usually entirely dynamic, with new data being added in real-time without the row/column setup of an SQL database.</p> <p>Other data types such as wide-column stores, still offer great flexibility but may not be updatable in real-time.</p>

	SQL Databases	NoSQL Databases
Scaling	SQL databases scale vertically. Meaning that as the data silo grows in size, servers will need to be upgraded with storage and processing capacity.	NoSQL scales horizontally. This means that as the data silo grows, additional servers can be added as shards, and NoSQL will scale across these new resources automatically.
Development Model	Some open source such as MySQL and Postgres. Some commercial such as Oracle and MSSQL.	Fully open source with ongoing innovation.
Supports Transactions	Transactional database updates are available.	Transactional database updates are available in some circumstances.
Data Manipulation	Language specific SQL syntax is used to build queries. For example, <code>SELECT ALL FROM <table> WHERE.</code>	Data is accessed via standard API calls.
Consistency	A very strong level of consistency is available.	Dependent upon product used. For example, MongoDB offers strong consistency, whilst Cassandra offers eventual consistency

SandSIV VoC Hub – A Dual Cloud Solution

Taking into consideration all that has been presented in this document so far, we can safely say that for any business to begin gaining a strategic competitive advantage through leveraging Customer Intelligence derived from the Voice of the Customer, some innovative technology is going to be required.

SandSIV has developed just this type of technology, a dual cloud based VoC Hub that delivers on all of the requirements for empowering the Voice of the Customer.

The SandSIV VoC Hub is a multi-layered product, delivering specific capabilities and features at each layer. These layers are termed by SandSIV as collection, discovery, integration, analysis and delivery.

The Collection Layer

As the name suggests, the collection layer gathers all of the heterogeneous sources of the Voice of the Customer. This layer can take incoming VoC data from any source, such as feedback survey results, social networking comments, support call logs, CRM data, absolutely anything.

Think of the collection layer being the top of the funnel, where we throw all of the unstructured and structured data into, for it to be actioned by the layers below it.

The Discovery Layer

The power behind the discovery layer is the STORM technology. This is a distributed real-time computational system. STORM delivers the capability to process in real-time, unbound data streams. This provides the ability to perform real-time analytics and machine

“ Think of the collection layer being the top of the funnel, where we throw all of the unstructured and structured data into.”

learning entirely in real-time and on demand. STORM is extremely fast, highly scalable and able to maintain continuous computation using minimal resources.

STORM, in effect, acts as a pre-processing layer, enabling the SandSIV VoC Hub to perform intelligent filtering and analysis of incoming data streams captured by the collection layer.

STORM uses just three abstractions, and these are spouts, bolts and topologies.

A spout is used to read from a syndicated queue, using a broker such as Kestrel, Kafka or RabbitMQ. A good example of the use of a spout is the capture of data from a Twitter stream using an API call.

A bolt can take multiple input streams, and combine them into a single output stream. Bolts perform much of the computation, joining streams, creating data filters, pulling in data from databases and aggregated streams.

A topology is a defined network of both spouts and bolts. A topology is a complex construct that runs continuously, performing the predefined actions based on the relationship of spouts and bolts it contains.



The Integration Layer

Within this layer, we handle all of the storage requirements, and the challenges that need to be overcome to integrate them into a single Big Data silo. The integration layer uses three separate technologies to deliver a dual cloud approach to solving this complex problem. These are MongoDB, Apache SOLR and Neo4J.

What is MongoDB?

MongoDB is a market leading NoSQL database platform, bringing all the advantages of NoSQL as explained in previous sections of this document. MongoDB is highly scalable, and delivers extremely high levels of performance.

MongoDB is an agile NoSQL solution that facilitates rapid changes to applications as data requirements evolve. On top of this, MongoDB also provides all of the kinds of features that traditional relational databases offer if they are required, such as a full SQL language and strict consistency.

What is Apache SOLR?

Apache SOLR is the search technology used by many of the world's largest websites. Part of the Lucene™ project, SOLR is a blazingly fast, enterprise level search platform. Apache SOLR has many advanced features that include a powerful full-text search, hit highlighting, faceted search, near real-time indexing, dynamic clustering, database integration, rich document handling, and geospatial search.



Apache SOLR is scalable, and entirely fault tolerant. It provides load balanced, and robust search capabilities, using a centralized configuration.

What is Neo4J

Neo4J is a scalable notice graph database. A graph database, as the name suggests, stores data as a graph. This data is then made available for presentation. Neo4J is used by thousands of companies around the globe to store and present this kind of data structure.

The Analysis Layer

Companies are storing ever increasing volumes of data. This data has value only if we can extract insights from it. The analysis layer of the SandSIV VoC Hub is an incredibly powerful Big Data analytics application, which is able to extract Customer Intelligence from all available customer knowledge stored within the VoC Hub.

Traditional data mining techniques simply do not work well within the high volume, unstructured Big Data environment. VoC Hub overcomes this problem by leveraging two specific technologies: Spring XD and LingPipe.

Spring XD is a completely unified, distributed system for the ingestion of data, and for performing real-time analytics as well as batch processing and then the export of data. Spring is a mature technology, with a 6 year track record of enabling enterprises to integrate data silos, and perform batch processing. Spring XD takes things a little further, by providing a runtime environment that is lightweight, and simple to configure.

LingPipe consists of a set of Java tools that provide a very powerful Natural Language Processing (NLP) capability. NLP functions include fuzzy dictionary matching, chunking, part of speech tagging,



clustering, classification, core reference resolution, named entity detection, sentence detection and tokenization.

The Delivery/Presentation Layer

The final layer that forms part of the entire SandSIV VoC hub solution, is responsible for delivering Customer Intelligence and insights in an easy to understand, and more importantly, actionable manner.

Intelligence can be presented in numerous ways. At a most basic level, this can be BI reports and other similar static information. However, the real power of the Delivery/Presentation layer comes from the ability for users to configure real-time visual dashboards. These dashboards are user/role specific, meaning tailored dashboards can be deployed strategically, containing information most useful to the employees accessing it.

Additionally, Customer Intelligence can be piped in to any third party applications that the business may already be using. This adds a further level of accessibility, making Customer Intelligence produced by the VoC Hub available within other strategic business systems.

In Conclusion

The SandSIV VoC Hub is unique in the way that it can take many disconnected data

streams, and turn them into a single source of actionable Customer Intelligence. This is achieved with very little integration overhead, due to the Big Data capabilities of the VoC Hub.

By taking data from every conceivable source, such as CRM systems, social media, customer feedback surveys, financial/ transaction data, disconnected data warehouses, and indeed, any conceivable form of customer knowledge, the SandSIV VoC Hub delivers additional value, as the interface between the various systems that produced this data.

The result is the ability to receive in real-time, an entirely holistic, 360 degree view of the business, and its relationship with its customers. This resulting Customer Intelligence can be used to drive strategic business decisions, based on solid insights, in a very agile manner.

“ Customer Intelligence can be piped in to any third party applications that the business may already be using.”

About SandSIV

SandSIV enables world leading companies to gather superior customer intelligence. Through its purpose-built modular SaaS solution and expert Customer Experience Management (CXM) and Voice of the Customer (VoC) consulting, SandSIV is a recognized global leader in VoC and CXM. SandSIV solutions directly contribute to increased operational efficiency, help accelerate business performance and provide measurable impact on revenues and the bottom-line.

SandSIV operates globally and specializes in the following industry verticals: Automotive, Entertainment, Financials, Hospitality, Media, Retail, Telecoms, Transport and Utilities. The company is headquartered in Switzerland with representative offices and distribution partners across EMEA.

SandSIV empowers its clients with the ability to understand their customers faster and more intimately than their competitors and to utilize customer intelligence to drive continuous improvements within their organization.

By closing the gap between their customers' expectations and the delivery experience, SandSIV provides its clients with a complete VoC solution to support

a holistic CXM business strategy. SandSIV enables a real business transformation towards a customer-centric business model – underpinned with our passion to deliver superior customer intelligence.



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