

Any people facing service sector in the health-care and hospitality industry generates huge data in every transaction it commits. A patient or a physician treating various patients, are the two main human agents who generate data while they interact. Physicians treat patients for whom they need the previous treatment history of the patient as well as the disease history. The disease history in turn needs a set of associated or frequently affine diseases- the physician needs to keep his caution while treatment. An information system has to assist the physician in these areas, Data for one set of <Physician, Patient> duple have many sets and all of these need be captured.

Treatment again generates more than one set of data as it deals with a set of information whose each element has to have a Physician, Patient and the specific treatment, viz. <Physician, Patient, Disease, Treatment>. Thus the more we tread dip into the health care system, the more sets of data we get to handle with.

Problematic in Health care information handling:

Information is derived from data by attributing meaning to them. Imparting meaning entails

- categorization,
- making the right hierarchy,
- establishing the right relationship between different sets aided by the categories,
- storing data for the sake of fast, easy and proper retrieval,
- Proper presentation through groupings, aggregation, averaging and trend fathoming.

Any relevant information building has to churn the data at a very fast pace and yet very flexibly group, regroup, present and re-present data.

Usual solutions:

The very first cut solution provided by the Solution-Providing-IT industry is to think in terms of Models. Modelling is an art and science that provides meaning with specific precision but comes with the baggage of a set of assumptions. In the process the complexity of operation increases telling upon the ease and flexibility. Providing structures to the data makes the data bound with the structure and re-structuring is an unlearning process that the user cannot do avert. This is the Business Intelligence solution set. BI solutions exigent many intermediate data store toward the final repository from which the presentations could be triggered. All these intermediate steps add to the complexity. Health Care industry as it is holds and moves around with multiple data sets that are relationally connected. Adding complexities to those is a big price toward finding meaningfulness.

Business Analytics is the study of models. Figuring out knowledge artefacts that would be relevant for a business analyst unwittingly has to depend on the technical expertise of model building.

Alternative and smart path:

Data Analytics is the alternative track offered to data-intensive-people-facing service sectors that keep on generating newer data sets in every transaction. Data analytics avoid the track of modelling by hitting the transaction data in every query without disturbing the transaction processing, and yet they can shift that information to the presentation level. The transient nature of data gathering makes the system slick enough to change, update, re-structure the query at will and in every viewing get the current data. The currency that



is so characteristic of transaction data was the objective of data analytics and that has added a new dimension to the knowledge industry. Typically a data analytics solution aims at providing:

- Self-servicing of the data by the user directly from the transaction store
- Fast and easy handling of data updatable with every change and moment
- Automatic reflection of data changes in existing reports or presentations.
- High Security of the data insulated from plagiarising, hacking and phishing

Typical systems working as sources of transaction data in the Health-care-service-sector:

The catchment spaces from which any Health Care system draws data are typically:

- Laboratory information system from which the clinical and pathological test data come.
- Laboratory information management system providing the <patient, revenue> data come.
- Direct patient care system that provides <patient, disease, treatment> data.
- Electronic medical recording system providing medical history of patients.
- Point of Care informational system that delivers < treatment, revenue> data
- Delivery of Care system providing the effectiveness and profitability of care, its reusability, its popularity and its growth by periods.

These data sources acting as sub-systems give all relevant data in the whole spectrum of Point-of-transaction-capture to the final presentation of them in dashboards.

The derived space, that we garner from these data are:

- Physician and patient behaviour
- Disease area, its demographic and geographic footfalls area, their dynamics
- Physicians’ treatment choices, inclinations in curative measures.
- Physicians’ contribution per patient in treatment, in pathological tests.
- Patients’ repeat visits with respect to various diseases.
- Revenue per patient vis-à-vis cost incurred in care and categorization of profitability.
- Inventory information management sub-system.

Technical challenges:

The usual and specific technical challenges associated in culling data from this sources/sub- systems are:

- Data reside in different systems in different formats.
- The currency of different systems differs.
- Integration of all these systems in one operational centralized data pool requires handling a big metadata dictionary,
- Modelling of such a uniform central pool loses the ready update-ability of the transaction data and requires very organized and tight management in uploading and updating of the data in the central pool vis-à-vis the various transactional sources.
- Models are cumbersome to build and painful to dismantle and re-organize.
- Dashboards reflect the intermediate databases and not the transactional changes automatically so the model loses currency and authenticity of the transactional updates.



- Accessibility of medicines, blood and other life-critical elements.
- how comfortable is the package in terms of profit earning keeping in mind the repeat visits of the clientele.
- How effective and smooth is the follow up outdoor service provided to the treated customers after major treatments or visits.

All these need to be immediately available on ad-hoc, self-serving and fast-retrieval of information directly from the transaction database. Model-induced results might be very attractive when presented but imposes a high degree of non-flexibility in terms of ad-hoc query firing by non-technically concerned business analysts. Each business analyst looks into the data with a different gaze and wants to have his/her own set of queries or artefacts to dig deep inside the data. The hierarchy of data rendition cannot be directed and dictated from any centralized pool of metadata repository both due to security considerations and from speedy retrieval and yet the authenticity point of view.

Our distinction in experience:

Working in Kolkata and in various cities in India has given us a very different kind of knowledge experience vis-à-vis our experience in the French and European theatre. Facilities are specifically and very keenly concerned with the general performance metrics of a package they have formulated, the outlying cases that is those cases that went beyond the package and the reasons behind them, put in the right controls and then monitor the efficacy of those controls. We have figured out that mostly the unregulated usage of non-medicine resource materials in critical operations, in ICU, ICCU, ITU and those specialized work-areas are responsible for these cost overruns. The emergency facilities and un-regulated care given to epidemics cost the facility in real terms.

A very distinguished case study in strategically placed super-speciality and multi-speciality hospitals has led the management to restructure their marketing focus in special geographic and demographic areas. The marketing department has come to know what type of customers from which territory has the reputation of the facility and has helped them work on those concerned spots for a face-lift and specialized focus. For very hereto-unknown reasons some specific hospitals were popular in some geographic territories among some demographic sections for some specific speciality and that there are other specialities provided by the same hospital was unknown to that territory. Thus the marketing team spruced up their efforts in giving those territories that they have many specialities and all these specialities are as good as the ones they were famous for. Revenue wise this was a tremendous advantage thus obtained. Such performances change even on weekly basis and need to be immediately brought to the notice of various businesses.

Only self-serving ad-hoc transaction-facing data analytics products can do the necessary justice toward assisting the business analysts and designers very fast and ready.

Data handling edge:

Our experiences with our Data Analytics product IDEAL ANALYTICS [IA] have given us a very coveted confidence and muscle in mammoth data handling. Terabyte sized datasets that took more than 76 hours in the best of the industry BI products from the leading providers actually took only 4.5 hours in IA. This was possible because of the unique mathematical technique IA uses within the product and yet encapsulates the complexity from the analyst-user, end-user or power-user. They are simply empowered by the ease of



forming simple and complex queries without any prior knowledge of query writing skills. The query building can be template driven and/or suggestive aids to form/edit/correct the queries and fire them with proper optimization, and that optimization is automatic and encapsulated from the users. Mammoth multi-level matrix transformations, inversion and other mathematical jugglery have been optimized in the best possible way within the industry solution spectrum. The wizardry of the technology of data-analytics combined with that of the specific intervention by the IDEAL ANALYTICS has made the product a very successful rookie pacing up with the best of the speed and skill. Finding the best algorithm of partitioning and inversion of mammoth multilevel matrices was the key challenge we envisioned and found the most elegant solution. This gave us the confidence of re-organizing the queries in every instance and yet gives the solution the best possible response time. Business wise this move helped us tackle the problematic of datasets without pre-modelling them.

Datasets from various sources typically come from existing systems and the usual approach of first collating them into one single format and pool loses the authenticity of the data in terms of currency and dirty reads. IDEAL ANALYTICS [IA] uses unique methods to cull in the necessary data and create its own working data set from any numbers and any types of database [dbms or flat file or spreadsheets] Without changing the nature of the native dataset, the product IA creates its working dataset on-the-fly transient and yet reusable with point of fire queries to maintain the currency and authenticity.

Cross-dataset operations, leveraging one fact from one dataset with dimensions from unrelated datasets on-the-fly is one very important aspect IA specifically as a data-analytics tools provides over and above the cumbersome less-flexible models of Business analytics packages built on OLAP technology.

Ideal analytics brings to the client three levels of triumphs

1. Benefits of general data-analytics tools over OLAP based business analytics tools.
2. Benefits of specialized matrix manipulation technology used in IA over other data analytics tools
3. Benefits of very specific cross dataset-type of operations and user-level almost zero level prior-experience that is inbuilt and yet isolated from end user, that is built in IA.

Security versus authenticity and currency:

In Business Analytics packages the stringency of secured data rendition with various levels of privilege compromises with the point-of-capture authenticity. The exposure of the working data set compromises the various levels of privileges in security considerations. Securing the final rendition of data is not enough and can be easily tampered by professional users when they are working off different nodes in distribution network. The working dataset need to have the security with respect to individual user individually and group-wise.

Personal rendition as distinct from corporate rendition of data from same or different data-sets and even individual choices of data presentation from the same corporate data set built-in with the varying levels of authorization enhances the security assurance and still not compromising on the veracity and currency of the data.

This feature is of prime import in any collaborative industry and much more in health-care industries where even a professional analyst may not or should not be exposed all intricate details of individual clients, as limited by regulatory authorities and laws of the land.



Sharing, exporting and embedding of data in presentation papers:

Data may and can be rendered and presented, but can they be re-presented or represented with its own nature, security and authenticity in outside tool presentation papers? This problematic had been in deep consideration within the representation circle of the industry. We have more of soft representations like web, webinars, videos, on-line and real-time accesses than our original hard copy representations and yet hard or soft the currency of the transaction data need to be represented without any lag or time-delay than the point-of-acquisition.

IDEAL ANALYTICS [IA] embeds the access mechanism through state-less html scripts that can be copied and pasted in any document soft or hard. Of course for accessing them the final document has to be mounted on soft platforms with the internet working behind. The access however is restricted and limited by the access logic in built in the users' identity. So in any further off-site presentation the access through the hyperlink is assured that hits either the cloud where the datasets are housing or the dedicated server where the URL and the authentication would lead. The statelessness of the html has insulated any data from any kind of tampering from any number and kind of remote access through the web or internet. The presentation layer does not need to bother about the residence of the data in any intermediate layer.

Not to conclude but to start with:

IDEAL-ANALYTICS - the company strived to come forward toward solving the basic problematic of huge data handling and the complexity of presentation technology through very elegant means through its flagship product IDEAL ANALYTICS [IA]. How far we have succeeded is up to the end client and our associates to decide and declare. What we have found till now is quite exciting and invigorating. We are in the track of a continuous development in providing specific and generic solutions to our clientele and incorporating the common and interesting features to our product. We developed this product from scratch so we are assuring our clients of updating it with the need and actually on-demand.

Functions may and can easily be incorporated in this product on-demand and on-justification. We wish to keep it handy and flexible enough to make it portable for installations and to be catered as Software-as-a-Service [SaaS] depending on the clients' need and wish.

We grow individually and in group with our customers and partners. We plan to keep it like that, we wish to develop with the deeper insights and provisions in the knowledge industry. Your KPAs are ours to share and own. Your indulgence, association and appreciation is what we capitalize on. We would help you grow on us and with us. Your signature is our metric.



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