

Release the Inner Superpower by Liberating your Brightest and Best

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Are we missing the obvious and overcomplicating the simple? In our drive towards success, are we squandering what could be our most fearsome competitive edge? I believe that every R&D organisation has an inner superpower waiting to be unleashed – and what's more, most of them are yet to discover it. Those smart enough to see what is staring everyone in the face have the opportunity to harness their industry's most constructive weapon - data.

When R&D centric companies create, use and monetise information, across all sectors, from pharma to food, their raw asset – data – has value. It is a capital asset. And when that data is added to, interpreted and shared, it becomes increasingly more complex and valuable. The creation of capital assets requires a complex inter-dependent community of projects, supported by various teams, each providing skills and insight to move products from inception to delivery: an ecosystem of ideas, data and information.

Collaboration within Complex Iterative Processes

What if the data ecosystem's potential is constantly stifled and undermined by ineffective collaboration, and something as simple as efficiently moving data from one person to another, and effectively aligning data from internal or external collaborators, is continuously hampered? This is real life for the vast majority of researchers today, and this status quo must be challenged and changed. R&D has been traditionally considered to be a linear progression through multidisciplinary teams chained together to provide; basic research, new product discovery, regulated trials and manufacturing. This heritage concept does not reflect the way that these teams really generate the information asset and, in practice, serves to entrench a siloed mentality, often reinforced by historical management and informatics structures.

In reality, data, information and knowledge are created through complex iterative processes that span research, development, patent filing, manufacture and post-market. It has always been a collaborative data ecosystem and over recent years, it has become an increasingly globalised, multiparty environment. The volume and complexity of the information we share grows exponentially and this has profound meaning for how we use and further exploit both our internal, and the new global, communities to increase R&D productivity.

But today's data ecosystem is unstable. It is highly fragmented with researchers having to use multiple, often disjointed systems to capture, compute and structure their data. Notable is the prevalence of legacy in-house systems. These represent niches within the ecosystem that are often vestigial: an important workaround from some time in history that is now an impediment.

Maintaining the Flow of Ideas

Leaders in R&D believe that data and processes, however disparate they may be, should be interoperable across the enterprise and they use this as a vision to change their culture. Siloes of activity and of thinking build up through a simple lack of visibility of one another, which breeds mistrust. Once a real-time data connection can be made between them it is possible to start aligning decision-making and process steps. This enables organisational change, process insight and innovation, with unparalleled flexibility. As John Reynders, head of R&D Information at AstraZeneca points out with regards to accelerating R&D, "the role of informatics and information is crucial"[1].

R&D entities undertake constant organisational change to harness and exploit the best minds. Companies have tried grouping by region, by small business units and by discipline. There is probably not a winning model based upon this alone. Organisational structures define barriers. Therefore, as Reynders describes, the critical function of each part of the organisation is to understand how to work across these interfaces and maintain the flow of ideas.

The world's pharmaceutical giants are not the only ones taking this approach. Industrial Research and Development-to-Manufacturing Organisations (RDMOs) such as BASF, Total, Cargill, L'Oreal, Kemin, Danone, Becton Dickinson and others have recognised its importance for continuous business improvement (CBI) and are rapidly coming to value their data. Their benefits are not just institutional but quantifiable, with Solae (now Dupont) disclosing a saving of 5-8 hours *per scientist per week* at a meeting in Berlin [2] last year.

High Quality Data is Born by Capturing with Context

Everyone in today's distributed R&D model can and should be provided with access to a data platform that enables them to share high context secure access to what everyone else is doing and how they are doing it. Gartner Inc recently highlighted the availability of global R&D knowledge management systems that support multidiscipline collaboration [3].

Enterprise class systems can offer high quality data capture, ontology control and security as

well as vital contextualisation. Unfortunately, often this vital context and provenance is lost, ignored, or forgotten, dramatically reducing the data's ability to be compared or used. When this happens community trust in the data is reduced or lost entirely, and given the value of today's data and IP assets, this is wholly unacceptable.

In an increasingly federated data environment all this context has another important role: *only* if there are high context, connected stores can federated data be effectively aggregated and assimilated. This aggregation, integral to the new hype term of 'data discovery' is vital in creating a high quality information landscape; one that can be made available to relevant decision makers, enterprise analytics and the chosen community at large.

Welcome to Virtual Lab Meetings – Enabling Conversation

Scientists are naturally social creatures when you put them together. However, if there is a stereotype or characteristic of R&D folks it seems to be that they are very much better at communicating locally and personally rather than between groups or over distances. Long distance relationships need relentless conversations, driven by high context and right-time access to each other's data. Trying to convince people to communicate by trading documents or scavenging from a drop-box reduces social interaction. Scientific arguments should be peer to peer, not by paper and PowerPoint™, so how do we overcome these barriers? What we need to do is blow open the pigeonhole and create the virtual lab meeting.

What do scientists in lab meetings talk about? Concepts, protocols, process perhaps? All of these, but there is nothing quite like real data to stimulate discussion, debate and innovation; the clash of challenge upon hard fact to generate new thinking. This is all well and good across a coffee in the canteen with everyone bringing in their lab books, but nigh on impossible if your organisation is one of today's highly diversified, externalised and collaboration dependant. Thomas Stallkamp, Director of Baxter and founder of Collaborative Management LLC says, "the secret is to gang up on the problem, rather than each other." And if scientists are to 'gang up' effectively, we need to enable this conversation.

Yet again this is actually all about managing data and information properly. It can be solved in part by software but its mentor is effective business change: breaking down the barriers that today are stopping scientists being scientists; recognising that the dialogue between colleagues is a valuable piece of knowledge as important as the data they are debating.

Social Media Tools for Scientists – Creating More Valuable Context

We are high tech creatures now: connected and ready for our 4G upgrade. Many of us use social media in our private lives. But are we extending today's power of managed data into our professional worlds? A recent report from McKinsey [4] discusses the untapped value from social technologies lying in "improved communications and collaboration within and across enterprises." This idea of social media as a serious business tool is an important one. Adapting emerging social norms such as tagging, commenting and sharing into the scientific environment requires thought about how these concepts work, applied with closeness and context to the data being shared. The rapid expansion of the electronic notebook environment is the key to introducing social interaction into the data generation and capture environment. Leading R&D information systems like IDBS' E-WorkBook now allow the secure social tagging of comments, experiments and even the data within them. Telling your co-workers that they should look at the experiment or real-time report, to check out this image, trace or graph is just what you would do around the canteen table. Pointing out that certain work has already been done elsewhere, or that you have confounding data, is also vital

to the mix. It enables crowdsourcing of comment and a virtual lab meeting of opinions to be garnered and - most importantly - stored. This collation of interaction is not transactional Twitteresque noise. It is the collective brains of the organisation doing what they are paid to do: adding to the corpus of knowledge.

Time to Release the Superpower

We no longer need to accept the limitations of the past. New thinking and today's best data technology is now needed in these exciting, challenging times. We must free up our scientists, to enable them to fully collaborate, peer to peer, and do what they do best: discuss, debate and innovate. We must give them the ability and social media tools to create the highest context, highest value distributed datasets to make data reusable. It is now more about the quality of material our Big Data analytics has to work on, rather than the choice of algorithm. It's about how good you are at closing the 'data gaps' rather than dodging them.

Liberating the brightest and best means using the power of managed data to tear down the barriers that artificially divide them. We use foundation principles of context, provenance, curation and connectivity so that the highest quality datasets and collaboration tools can be created. And that really will release the inner R&D superpower in us all.

References

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- [3] Manufacturers Must Consider Scientific Domain Expertise During ELN Selection, Michael Shanler, Gartner, published January 11, 2013.
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New Independent Validation Study Shows Rapid Automated System is as Accurate as Manual Colony Counting

Synbiosis is delighted to announce its ProtoCOL 3 rapid automated colony counter has been shown in an independent study to perform with the same level of accuracy as manual colony counting for enumerating 10 different types of microbial colonies on a range of agar plates.

The study, which was performed to GLP-compliant standards at Don Whitley Scientific Contract Microbiology Laboratory, compared the ProtoCOL 3 system with manual counting for enumeration of bacterial, yeast and fungal colonies on either Plate Count Agar, Columbia Blood Agar or Sabouraud Dextrose Agar plates.

These plates were surface spread or spiral plated with one of the following organisms: *Pseudomonas aeruginosa*, *Escherichia coli*, *Staphylococcus aureus*, *Kocuria rhizophila*, *Enterococcus faecalis*, *Mannheimia haemolytica*, *Bacillus subtilis*, *Streptococcus pneumoniae*, *Candida albicans* and *Aspergillus brasiliensis*. The resulting colonies were then enumerated both manually and using the ProtoCOL 3's powerful software to produce a count.

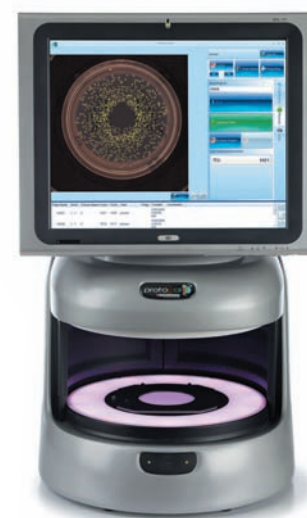
For each plate type (spiral and spread) the comparison between ProtoCOL 3 and manual counts were analysed statistically using a t-test. The results ($p = 0.105$ for spiral plate data and $p = 0.143$ for spread plate data) did not identify significant

differences between manual and the automated counting methods, for either plate type, at the 95% confidence level.

Martin Smith at Synbiosis commented: "The microorganisms in this independent study produce colonies of differing colours, shapes and sizes and were also cultured on both translucent and opaque agars, which means some are a real challenge to count automatically. We're delighted with the results of this study because they show that there is no significant difference between the accuracy of

manual and automated counting with the ProtoCOL 3 in what are realistic evaluation situations you'd see in many microbiology laboratories."

Martin continued: "Being able to accurately enumerate so many types of colonies on different agars is a task very few automated colony counters can perform well and this study validates the ProtoCOL 3's versatility for this application. Microbiologists looking to increase their throughput of plate counts can now install a ProtoCOL 3, confident that they will automatically count many different types of bacteria, fungi and yeast in a fraction of the time, while still guaranteeing the accuracy they demand from a manual count."



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New Platform for Automated Buffy Coat Isolation Developed



Tecan and IBBL (Integrated BioBank of Luxembourg) have successfully co-developed an automated platform for buffy coat extraction based on a Freedom EVO® 200 workstation, relieving scientific staff from performing this time-consuming task, and significantly increasing the yield of DNA.

The process of manually isolating the buffy coat from whole blood is traditionally slow, tedious and very dependent on the skill and dexterity of the technician separating the layers.

This lengthy and variable element of sampling has been eliminated by automating the procedure on a Freedom EVO 200 platform, optimised to maximise the yield and quality of the buffy coat and minimise the risk of cross-contamination.

Fay Betsou, Chief of Biospecimen Science at IBBL, explained: "The Freedom EVO's Liquid Handling (LiHa) Arm pipettes the buffy coat layer with very precise orientation and speed, standardising the process and eliminating technician-to-technician variation. This gives a purer buffy coat product, with less contamination from red blood cells and haemoglobin and a similar distribution of white blood cells. The results are amazing; the DNA yield is 10 -15% higher using the automated process, and the Freedom EVO system can process 24 samples in just 16 minutes. We are very satisfied with the system, and are looking forward to working with Tecan on another biospecimen research project in the near future."

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Updated LIMS Software allows Laboratories to Track Sample Certification Documents

Two Fold Software has introduced a new functionality to its Qualoupe LIMS software. Customers can now achieve full traceability for their samples' Certificates of Analysis (COAs). COAs are vital in authenticating the purity and quality of samples and substances within laboratories. With Qualoupe LIMS, certificates for both individual and batches of samples can be created in just one click, with each assigned its own unique certificate and version number to allow for easy tracking. Users also have the option to get the relevant COA emailed straight to their inbox.

In many cases COAs are simply generated as they are required, without a unique certificate number and with limited traceability. This latest update from Two Fold Software ensures that the COAs are stored as PDFs alongside the sample or batch record, and that the version number is renewed each time a certification is run. Qualoupe users are therefore assured of always being able to locate the latest certificate, and may quickly look back to trace who certified each sample on what date.

Two Fold Software, based in Aylesbury in the UK, is committed to providing affordable, fit for service software to all sizes of companies across a range of applications. By considering the challenges faced when working within a laboratory environment, each update to the Qualoupe LIMS software helps users carry on with their work in a more efficient and effective manner.

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