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Evolution in action

The way the data centre is delivered has evolved
What it means to you, your business and your future

A white paper by Colt

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The information delivery platform for European business

Overview – the evolution of the consumerised data centre

The modern business organisation has evolved to run on its data, and the demands it makes on its data centre has evolved with it. You need your data centre to store your data and secure it while paradoxically providing instant access. You need scalability, the flexibility to deal with emerging technologies and with rising energy costs, you also need it to be efficient and environmentally friendly.

The trouble is, the traditional data centre has not evolved in line with these demands.

However the birth of a new generation of data centres has begun. Modular data centres are becoming recognised as state of the art high quality power efficient data centres that can be delivered in as little as four months.

Basically this means that instead of being tied to a data centre that is obsolete by the time it is delivered, a business can now work with the latest data tools in the shortest possible time. It makes the operation more efficient, with reduced total cost of ownership, and prepared for growth.

Your data centre runs your business

In the modern organisation, every activity, from research and development to manufacturing and accounts depends on your data. 24x7 access is mission critical.

What was once a server room has grown into a data centre, and the data centre has grown into the hub of your organisation. But the exponential growth of data means the demands are still increasing. You must have cutting edge access, speed and security simply to stay competitive. And if your business is to be able to grow, that performance must be easily scalable.

The traditional data centre is struggling to keep up. The very nature of applications themselves is constantly changing, now more than ever. The Cloud is on the horizon, and so are new web-oriented, virtualised applications. Data centre capacity planning in this fast paced environment is difficult with a solution that can take years to build. Being able to effectively manage capacity and therefor capital expenditure and operational expenditure is a distinct competitive advantage.

Commissioning a new data centre in the traditional way is no longer the answer.

Why the data centre needs to change

A traditional data centre build can take up to three years before final handover takes place.

Analysis, planning and design alone can take up to 18 months. But as each is typically bespoke even putting a “average” timeframe is impossible. This lead time is now recognised as a major problem. Forecasting the actual operational needs of any organisation that far in the future is unrealistic. This means that by the time they are up and running, they are frequently either over specified or no longer adequate for actual operational needs.

Scalability can also be an issue. With many data centres, adding capacity can result in costly redesign, downtime or risks of traditional build project alongside an operating data centre.

In the past, these shortcomings were recognised, and grudgingly accepted as unavoidable facts of business life. However, exciting new technologies and harsh new economic realities have added new factors that make the traditional approach dangerously outdated.

Current data centre considerations

Capital Costs. The economic landscape is still challenging. Organisations no longer have access to the levels of capital they once had. At a time when controlling costs is vital, the cost of building a data centre is rising.

Operating costs. The growing price of energy is becoming more impactful on your bottom line. In the past the problem that traditional data centres faced was physically providing adequate power. These days the cost of that power is the challenge.

Environmental pressures. The traditional data centre has a large carbon footprint and contains environmentally hazardous materials which makes it harder to achieve the green goals that have become so important to shareholders.

Security and legislation. Keeping your data physically secure is not only a business priority, it is vital in order to comply with ever more stringent data collection, data protection and sustainability requirements.

New technologies. New developments in hardware such as high density blade servers are making traditional data centres less than ideal and difficult to update. Many of today's data centres are built pre dot-com bubble and companies are facing the increasing need to refresh, refurbish, move or consolidate.

All these factors – plus the need to adopt an agile and responsive approach mean a traditional approach is simply no longer adequate. You need to transform the way you think, build, deploy and operate your data centre.

Evolving the way the data centre is delivered - the consumerised approach

The challenge of providing a data centre should not be underestimated. It demands an environment – which can be a room or an independent structure - that is as clean as an operating theatre. It must be as secure as a bank vault and it may demand as much power as a small town. It needs to be controlled to specific temperature and humidity levels and operate with the resilience of an aircraft.

In the past, the only answer to those needs was the traditional approach. Improvised solutions, with servers mounted in shipping containers have been tried, and can offer extra capacity in short term emergencies. However, the reliability and durability of such arrangements inevitably falls short of that needed for business critical applications.

A complete, flexible data centre that is transforming the data centre business case has now emerged.

Delivered in just 4 months – not 3 years

We are calling it the consumerisation of the data centre. The approach is based on the concept of consumerisation and standardised modules. Instead of spending months designing a custom solution it uses standardised architecture and proven modular components to provide a solution tailored to the users' needs.

There are multiple suppliers in the market with multiple variants in the offer that range in quality and completeness. Some are semi modular, have modular components, some only provide cooling. Colts solution is a complete solution from the ceiling to the raised floor. Combining industry leading technology, with the knowledge of techniques pioneered for oil rig production, it allow us to plan, build and commission a state-of-the-art, high-quality, power efficient data centre in just four months. The modular data centre along with the entire infrastructure it needs, is pre-assembled and pre-staged in order to reduce the need for on-site integration.

Site work is minimal and limited to the building, provisioning of high voltage power and a small bore water supply. This means further dramatic time gains, often reducing weeks of commissioning and troubleshooting into days.

By adopting a manufactured approach, the performance and reliability of the completed hall can be precisely predicted and optimised.

The result is large scale. Data centres that match or exceed the durability and quality standards of a traditional data centre, but ready for work in a fraction of the time. They can be installed on a Colt site, to be managed as part of our data centre infrastructure, or to a customer's new or existing site.

Due to the modular nature Colt modular data centres are generally available in upwards of 500m2 'building blocks', which can be combined to meet any capacity needs and they can even be stacked when space is at a premium.

The benefits

The modular approach method provides several key points of difference over conventional ‘bricks and mortar’ builds.

- It allows the use of standardised, highest-quality components
- It ensures that cutting edge technology can be used in both servers and ancillary systems
- It provides a proven design with predictable performance
- Most significantly of all it can provide a new data centre in time with business timeframe of 4 months

These features translate into a number of significant benefits:

Faster time to market

Streamlining the design, manufacturing and commissioning process into just four months instead of the industry average of 27, brings obvious benefits. The customer gets the enhanced performance and facilities they need faster. The result can mean business acceleration.

It also means that the data centre can be a better fit for actual needs. The slow gestation of a traditional monolithic data centre means that by the time it is ready to go to work it will face business needs that did not exist when it was designed. The result is a data centre that will either be inadequate by the time it is ready to work, or which will have been overspecifed, resulting in excessive costs.

There is another point to consider. The rate of change of the IT industry is such that a data centre designed now will no longer offer cutting edge performance in two years’ time.

Increased flexibility/scalability

The unique pre-assembled modular architecture allows exceptionally easy and rapid deployment when the data centre is first built. It also ensures that the centre can offer unrivalled flexibility and scalability, with capacity for system extension designed. Easy ‘plug in’ expansion potential ensures that capacity can be right-sized, maintaining performance against growing demands, significantly extending the life of the centre, and improving ROI.

The ability to scale with the users’ needs means that capital is called on only when it is needed.

Improved efficiency

Colt's expertise in data centre design has allowed the modular data centre to deliver exceptional Power Usage Effectiveness (PUE).

A typical PUE for data centres built in the last 5 years is 1.70, with many legacy data centres as high as 2.50. Modular data centres are beating this hands down. The Colt data centre has an industry-leading PUE of 1.21.

This is achieved through efficient use of processing power and the ability to right-size the centre, avoiding the need for unnecessary infrastructure. It is also based on exceptionally efficient infrastructure provision, which can include ambient air cooling in many locations.

The cost of energy – which was not a even consideration in traditional data centres – is now a significant operating expenditure. A data centre with a PUE of 1.21 can provide significant savings - averaging around £3 million over 10 years in power bills in a typical 500 m2 installation.

Power use is not the only measurement, in fact in many cases low power use can be attributed to large amounts of water use and this needs to be given careful consideration in the selection process.

Environmental protection

The low PUE also provides important environmental benefits, supporting a reduced carbon footprint and water requirements as well as energy costs.

The environmental impact of business activities now has a significant effect on share prices, and this effect looks set to become even more significant in the future. The construction and eventual decommission and removal of a traditional data centre are both major environmental hazards.

For a modular design these hazards are much reduced. The facilities themselves are often designed with recycling in mind and both construction and decommissioning will centre on the delivery or removal of complete modules, rather than onsite construction or demolition with all the attendant risks. In fact, the recycling element can mean there is residual value at the end of life rather than financial liability for disposal.

Improved reliability

The Colt technology at the core of the modular data centre has been developed to offer exceptional standards of performance and reliability. Standardised, proven modules, factory built and tested into designs that are themselves standardised can offer performance which is absolutely predictable.

This is supported by a sophisticated system architecture, which will keep the system running even in the event of the failure of individual elements. Protecting it all is state of the art power supply, fire protection and security systems.

It all contributes to the reliability that any modern data focussed operation must have.

The business case for a modular data centre

The greatest benefits of utilising a modular data centre are actually commercial rather than technical. The costs of design & build, capital and time operations, power and downtime add up to significantly improved Total Cost of Ownership.

Data centre design & build

The bespoke data centre requires a prolonged period of analysis design and development before construction can even begin. Typically this may last for several months and involve significant costs even before the eventual cost of the project can be arrived at.

Just as important, this design process can involve a number of unknowns. While any reputable provider will be able to ensure a fully functioning system, because each design is individual, the actual performance on-site cannot be precisely predicted and will inevitably involve a period of troubleshooting before it is ready for handover.

The actual construction cost of the data centre may also be hard to predict. Because of the long lead times, significant increases in actual costs are not unusual. It will almost certainly be significantly higher than the costs achievable with a modular solution.

A proven modular data centre can offer entirely predictable design and build costs mitigating the costly risk of scope creep and resource absorbing lengthy design process.

Capital and time

A traditional bespoke data centre is usually designed and implemented on a straight critical construction path. The main power systems have to be installed, cooling plant sized, switchboards procured and the building designed or redesigned around it all.

This requires many assumptions about the eventual needs of the project and dictates that infrastructure is installed at the outset, even if the project can be split into phases. Upfront capital cost are therefore inevitably high and frequently over specified. It is common to have to outlay 40% of the capital cost to provide as little as 10% of the total project.

Modular data centres are built with self contained units, so they can be built in stages. While the full power supply will still be required, almost everything else is only delivered as and when it is needed. It means that 15% of the total project cost will deliver the first 10% of the project.

The capital cost picture is made far more dramatic by the long lead times of the traditional approach. Even if a phased programme can be developed these figures suggest that as much as 40% of the final capital outlay will have to be found not simply upfront, but as much as two years before the data centre is operational and any payback can begin.

Modular data centres therefore offer significantly reduced Capex and lead-time costs.

Operations and power

Energy represents category significant part of TCO and with current energy prices, the capital cost of a data centre will be exceeded by the power costs in as little as four years. Increasing processor power means increased absolute power usage and hence an increase in the cooling required.

By increasing the cooling demands, the level of maintenance and the sophistication of the units further increases.

The modular data centre was designed to reverse the trend by providing true energy efficiency, reducing energy use and cooling needs and so saving in the capital and operating costs. It does this by designing in the basic elements of an efficient facility. Sealed walls, doors and floors; efficient underfloor or overhead cooling systems – often including fresh or direct cooling systems which are capable of utilising external ambient conditions as a cooling medium for the facility, and air containment as a standard.

The other key operating cost – maintenance – is reduced by the use of standardised modules. A single package is replicated many times, simplifying the overall installation and reducing the need for specialised maintenance operations and then numbers of costly specialist staff required.

Downtime

The actual cost of downtime varies from organisation to organisation, but with the growing importance of data, it is becoming clear that any downtime will involve unacceptable costs.

The technology behind the Colt modular data centre has been developed for reliability through successive generations in service over the last 20 years. Deploying that technology in distributed, standardised infrastructure allows for redundancy and fast failover without interruption to service.

The improvement in overall TCO will of course vary from organisation to organisation and depend on many factors, including the size and scope of their operations. However, it would appear that in all cases the benefits of a modular data centre remain clear.

A word of warning though is to clearly evaluate your potential solutions. Not all modular data centres are the same. As previously mentioned there are substantial variants within the term “modular” ranging from container to traditional data centres and everything in between. Make sure the solution you are looking at has the flexibility to suit your needs, the quality to ensure reliability and the range of options.

The business options

Colt modular data centres are versatile, and their basic design includes a range of options that allow them to be provided for any environment, from the arctic to the tropics. In addition they can be provided in a number of ways to suit any business model.

Colt site

A data-centre-as-a-service model, with dedicated, space, facilities and power. A discrete data centre is provided on a Colt operated site and entirely managed by Colt.

Customer’s site

A data centre is designed, built and delivered to the customers site, and operated by their team.

New site

Colt will work with customers to identify a suitable site and design and an installation tailored for it.

In brief

A Colt data centre offers powerful gains in efficiency over older and traditional solutions. These efficiencies, in terms of reduced capital investment means overall business efficiency is increased.

A Colt data centre is designed to be flexible and can grow and develop with your business. This in turn means increased business flexibility, supporting development and ability to react to market opportunities instead of hindering it.

Perhaps most important of all, a Colt data centre can be available now, giving users a powerful business advantage over those tied to traditional solutions.

Want to know more?

If you're interested in finding out more about the benefits of an evolved consumerised approach to data centre provision and what you can achieve with Colt Data Centre Services, please contact us:
+44 (0) 20 7390 3900 or email dcsinformation@colt.net

About Colt

Colt is Europe's information delivery platform, enabling its customers to share, process and store their vital business information. Colt provides major organisations, midsize businesses and wholesale customers with a powerful resource that combines network and IT infrastructure with expertise in IT managed services, networking and communication solutions. Colt operates a 21-country, 35,000km network that includes metropolitan area networks in 39 major European cities with direct fibre connections into 18,000 buildings and Colt data centres.

We currently manage over 28,000m2 of data centre facilities. We are a FTSE 250 company with an international base, we have a record of financial security, and are a profitable and debt free organisation.

For more information about Colt services for midsize business please visit www.colt.net/dcs or email dcsinformation@colt.net

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