Datavalley Limited
Bangladesh

COMPANY PROFILE

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1. INTRODUCTION

DataValley Limited is a company specialized in empowering Data centers. Our experience team specialist in Data center consultancy, Design & Build, Project management and annual maintenance for your entire Data center infrastructure needs, make us a one stop Data center solution center.

DataValley Limited has selected best-of-breed and best-in-class Original Equipment Manufacturers (OEM) of the Data Center sub components that include Climate Control Units (CCU), Uninterruptible Power Supply (UPS), Power Distribution, Flooring, Access Control, Electrical Generator, Racks, Cable Trays, Lighting, Fire Suppression, Security, Management, etc.

Understanding that every customer is different and that every project has its own challenges, Therefore Vigorous and consistent technical activities and a commitment to offering good, well-structured planning and consulting services develop and deploy the best robust solution for our valuable clients. The provision of individually tailored solutions and expertise is always at the top of our priority list.

DataValley Limited welcome local/International System integrators, Telecommunication companies, IT companies working on projects together under teaming agreement. Like resources and technology mapping and allocations to that particular project, and working closely to integrate the project together and deliver the state of the art solution to the end users.

We at *DataValley Limited* are dedicated to provide cost-effective, world-class solutions ensuring complete customer satisfaction by partnering with technology Leaders in the industry.

1.1 Mission Statement

> "*DataValley Limited* is committed to serve our clients with confidence and offer by developing technology solutions designed in the planning of highly available, complex Data Center building services."

1.2 Our Commitments

- Provide quality products and cost effective solutions that meets the latest standards.
- Provide professional installations; ensure that our well trained, certified technicians and engineers are well synchronized with latest product and installation procedure.
- Thoroughly test, certify and warranty for all of our installation.
- Work with Main Contractor's schedule to avoid any project delay and meet the project deadline.
- Availability: to resolve any emergency issue and short notice services.

2. DATA CENTER SOLUTIONS

DataValley Limited provides comprehensive, professional design, implementation and integration, project management, technical support services. Our Data center Solutions leverage off our regional experience and reputation to provide customers with cost effective Data Center solutions through comprehensive, professional technical support services including sales, marketing, planning, design, implementation and integration.

With a commitment to providing the best in quality and service, our Data Center portfolio of solutions represent some of the leading global brands.

Our Core Capabilities include

|		
Raised Floor Access Ramp Cable Trays	Fire Rated Door Fire Rated Partition Suspended Ceiling	Electrical DB's Lighting Power Distribution
Climate Control Units (CCU) DX , Chiller Water	Uninterruptible Power Supply (UPS)	**Rack/Containment System**
Fire Suppression	Civil Work	**Project Management**

2.1 Data Center Tiers

There are four classifications of Data Center that will determine the theoretical amount of uptime you can achieve from design. Many ICT equipments do not need such levels of design and are classed as Computer Rooms or Equipment Room.

	Tier 1	Tier II	Tier III	Tier IV
Site availability	99.671%	99.749%	99.982%	99.995%
Downtime (hrs/yr)	28.8	22.0	1.6	0.4
Operations Center	Not required	Not required	Required	Required
Redundancy for power, cooling	N	N+1	N+1	2(N+1) or S+S
Gaseous fire suppression system	Not required	Not required	FM200 or Inergen	FM200 or Inergen
Redundant backbone pathways	Not required	Not required	Required	Required

The TIA942 standard is one of those recognized in worldwide. The above table is an excerpt, with the main parameter being uptime. The current *DataValley* view is that Tier IV is not cost effective and technically not possible to 100% comply with in our country. Redundant Data Center solutions at Tier II & Tier I are most cost effective in conjunction with DR infrastructure.
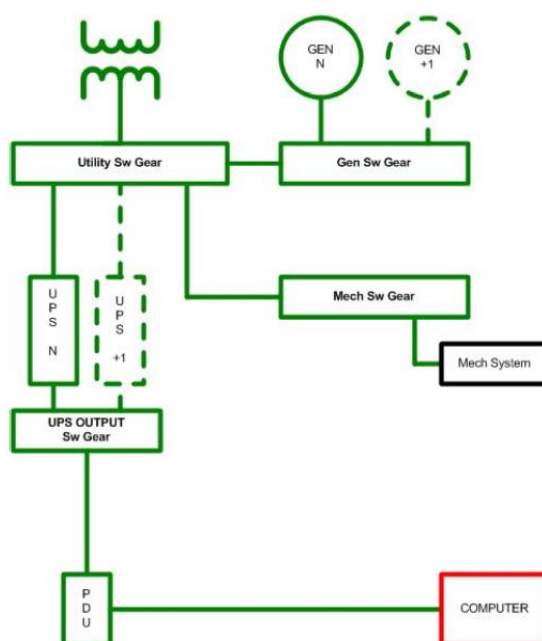
Typical Tier II Data Center Power Design

DataValley Limited offers a complete turnkey solution that covers all of the design, approvals, building, commissioning and maintenance of each Data Center. We understand the complexities of the relevant regulations and international standards.

2.2 Design Considerations

In creating a Data Center design the following points need careful consideration:

Location:

There may not always be choice in where the Data Center can be physically located, but it should ideally be at ground floor level. Basements are at risk of floods and higher levels have limitations on access, power availability, floor load, etc.

Do not locate Data Centers near airports or hazardous areas, in flood plains, areas of pedestrian and traffic congestion or away from utilities (sub stations, exchanges, cooling, etc).

2.3 *Raised Flooring*

You may elect for a raised floor although many next generation designs do not require this. Raised floors were traditionally for down-flow air ventilation and cable management but cable raceways at ceiling level and in-rack or water cooled designs do not need raised floors.

If a raised floor is selected then consider the following:

- *Load bearing capacity*
- *Height*
- *Finish/décor*
- *Access ramps*
- *Air grill and damper location*
- *Sealing air gaps*
- *Earth bond the metalwork*
- *Good and suitable finish to original floor*

2.4 Walls & ceiling

These need to be of solid construction due to air pressure, security, noise, vibration and fire rating requirements. Outside walls should be avoided and their thermal transfer (Heat Exchange) considered if they exist. These must be sealed for efficiency and fire suppression and fire fighting reasons

2.5 Access Ramp

A ramp is an essential design requirement for Data Centers with a raised floor. All doors must be locked and open to the outside for security, health & safety, and fire reasons.

2.6 Cables

Power & copper signal cables must be physically separated to prevent signal noise. Ideally locate power cables under floor and signal cables at ceiling level.

2.7 Best practices

Best practices and local regulations will require the following space allocations:

- *Data Center main room*
- *Network Operations Center (NOC)*
- *Electrical room*
- *Loading/testing area*
- *Electrical generator room*
- *Main Distribution Frame (MDF) room*
- *Battery and fire suppression room*
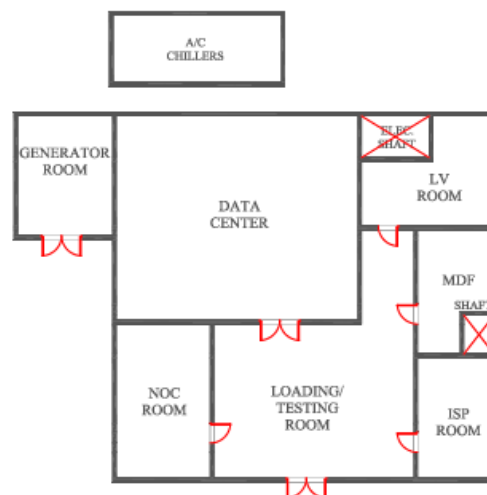
2.8   CCU

The Climate Control Unit (CCU) can be located at the periphery of the Data Center which is the more traditional design or within the cabinets as localized units. It is more efficient to have localized cooling as peripheral systems cool the complete Data Center and can create hot and cold spots.
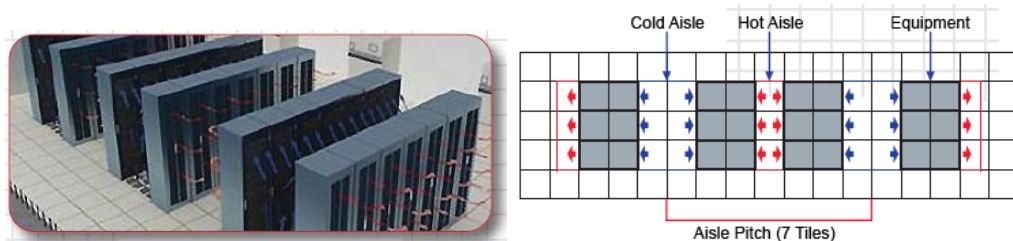
The Traditional hot aisle/ cold aisle design is not optimum for high density blades and servers that consume power that is usually> 12KW per cabinet.

Contained Cooling

Thermal containment maximizes the effectiveness of cooling solutions for high density servers & blades. These products are designed to completely separate the air supply and return paths.
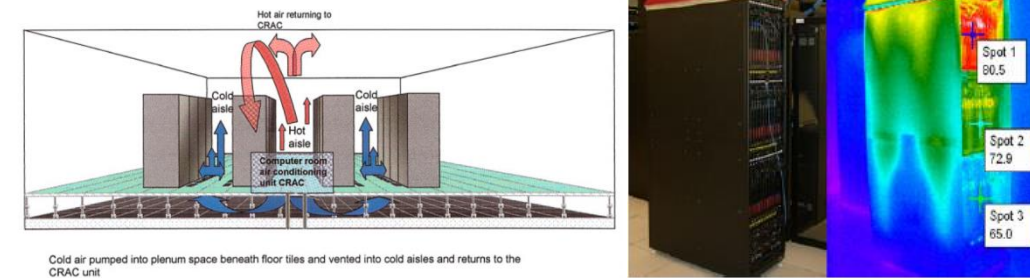
Airflow can be floor, side or roof designs depending on the cooling design within the Data Center. The management of power and signal cables will be within the rack.

2.9   UPS

Most Data Centers still use AC power. DC is becoming popular but is currently limited to Telco companies who have used it for their networking switching for many years.

The Uninterruptible Power Supply (UPS) system provides power conditioning via AC-DC-AC conversion and also provides sufficient power for systems to safely shutdown in case of a power failure. A UPS is typically only 90-95% efficient so it contributes negatively to the PUE ratio.
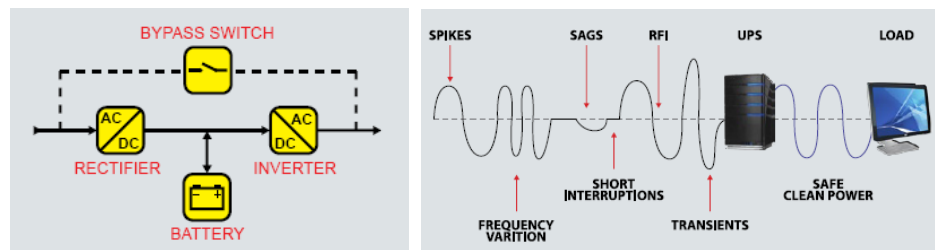
Power conditioning is vital as the quality of AC from Main Power Supply. will be prone to conditions that can be damaging to ICT equipment or can cause it to fail. These include sags where a power cycle is missing, reduced voltage levels, black outs (where the power is permantely lost) and brown outs (where power is not available for short periods).

The number of batteries required for shut down will be determined by the run time required, typically less than 20 minutes. In today's Data Centers this requires racks of batteries to create sufficient power. Space and weight is a key consideration.

2.10 Fire Suppression

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Gas suppression systems ensure your ICT systems are protected 24/7. By installing a gaseous fire suppression system you can starve a fire of oxygen or heat & therefore prohibit the environmental conditions for a fire to burn. Suppression systems will detect a fire in advance usually by smoke detectors, and trigger a series of outputs which will release a gas agent into the protected area i.e. Data Center.

To protect from false alarms (such as dust) a series of detector activations known as "double knock" have to be triggered in the event of a fire being detected. The gases we specify (i.e. Halon) are safe & environmentally friendly. They also have no clean up requirements if they are released.

2.11   Fire Fighting

The use of 'dry pipe' water sprinklers can be used effectively to achieve this without the risk of water leaks. Here the sprinkler is only activated when a wax seal is melted in the sprinkler by the heat and only then will water be released via the pipes. This is the optimum solution for large Data Centers where the fire suppression solution is not practical as the one shot chance to extinguish the fire may not solve the incident.

## 2.12   Power Distribution

Power distribution is a key consideration that covers the distribution of power from multiple AC sources such as substation or generator via Automatic Transfer Switches (ATS), Main Distribution Board (MDB), Power Distribution Units (PDU), etc.

The safety and capacity of the power system must be adequate.
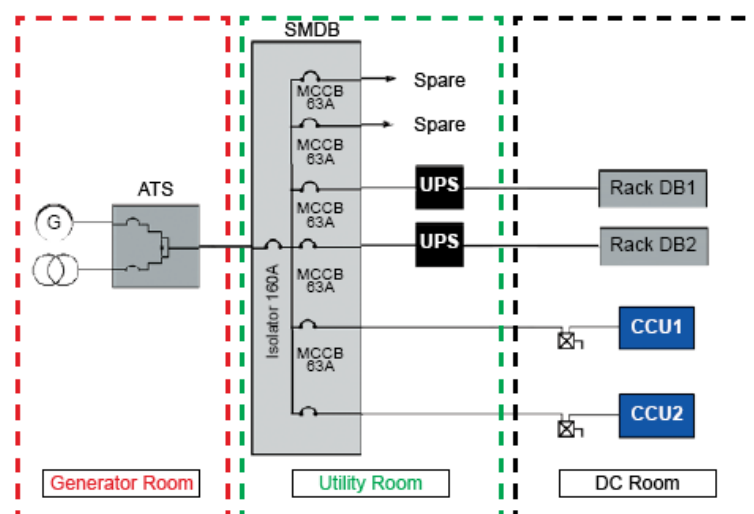
2.13   External Generators

These will be required to cover loss of main AC power. The units can be located in a building or external but require fuel tanks. The tank will define the period of operation. Typically full load is 8 hours.
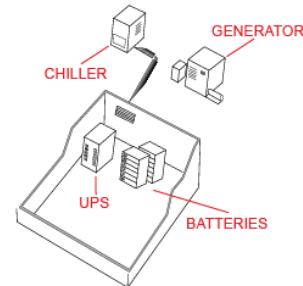
2.14   Power Management Tools

DataValley has developed its own tools for power management and design

PUE = Total Facility Power / IT Equipment Power

DCiE = IT Equipment Power / Total Facility Power
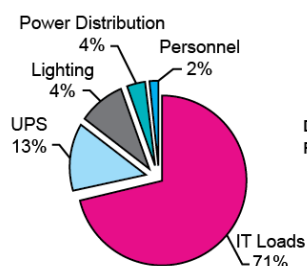
D/C Efficiency

DCiE%   58.94
PUE   1.70

PUE	DCiE	Level of Efficiency
3	33%	Very Inefficient
2.5	40%	Inefficient
2	50%	Average
1.5	67%	Efficient
1.2	83%	Very Efficient

Data Center infrastructure efficiency

| Cooling Calculation - Data Center 1 - 20 Racks						
Heat Generation Factors	**Description**	**Qty**	**Unit**	**Value**	**Multiplying factor**	**Total BTU**
Total area	Length in Mtr x Width in Mtr.	N/A	Sqm	104.58	337.00	35243.46
Human Occupants	Number of occupants inside DC1	0	No.	N/A	500.00	0
Server racks	Total Wattage of Server racks	5	W	8200	3.41	139810
Blade Server Racks	Total Wattage of Blade Server racks	2	W	20000	3.41	136400
Network Equipments	Total Wattage of Network equipments	2	W	6000	3.41	40920
Passive Rack	Total Wattage of passive equipments	1	W	0	3.41	0
Future Server Racks	Total Wattage of Server equipments	8	W	7000	3.41	190960
Future Blade Server Racks	Total Wattage of blade Server equipments	2	W	20000	3.41	136400
Heat load from UPS	Heat load from UPS	T.L*0.04+UPS load*0.05				0
Heat load from PDUs	Heat load from PDUs	T.L*0.01+UPS load*0.02				29
Lighting	Max. wattage of lighting	32	Sqm	104.58	3.41	38914
	Total in BTU			BTU		**718676**
	Total Heat load in Ton			TON		**59.89**
	Total Heat load in KW			KW		**209.61**
Cooling required	41.7KW of sensible cooling on Ambent temprature of 45C ° x 5 Units					
Solution	AIREDALE 45KW CCU units 4 down flow & 2 up flow , Dual fluid - DX & CW, 5 Units on duty +1 Standby					
	Power consumption per CCU unit on CW			KW		35
	Power consumption per CCU unit on DX			KW		43.5

2.15 Cabinets/Racks

Enclosed cabinets are the standard in the majority of Data Center environments due to security and airflow concerns. Standardization on a specific cabinet also provides a clean, organized feel and allows equipment to be easily relocated or installed.

42U is the most common size. Cabinet sizes can increase in width and breadth due to cooling and power requirements. The doors can be solid glass, perforated steel, etc. depending on the requirements for airflow.

2.16 Environmental Monitoring System

This is a key requirement regardless of how the Data Center is managed i.e. a lights out operation with extremely limited and controlled access or a facility with a NOC that has regular access to tape backup units, KVMs etc. The Data Center operates 24x7 so all alerts and alarms must be monitored and responded to.
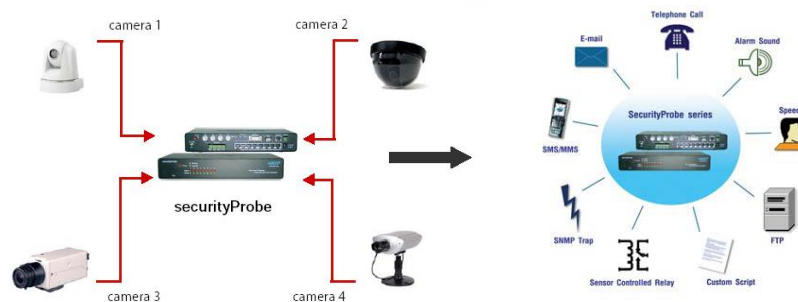
A good Environmental Monitoring System (EMS) will give many different interfaces. It is possible to monitor all areas of Data Center operations to include power failure, climate changing, leaks, etc. Such systems can be integrated in to a Building Management System (BMS) or Facilities Management

System (FMS) using many different protocols from simple dry relay contacts to SNMP to XML.

2.17   Access Control & Security

This requirement is a key one, and attention must be made to ensure sufficient access control and surveillance and monitoring are in place. This can be part of a Security Operations Center (SOC) or a localized responsibility. Equipment and data are both valuable assets that require effective protection against all types of threats.

2.18   Design to build to operate

We have qualified staff to design Data Centers from Tier I to Tier IV. We have completed many Data Center implementations, from large to small projects, covering all ICT products and solutions. *DataValley Limited* will review your needs and will consider the options ranging from hosting and collocation, to design and build.

We will cover all aspects of the Data Center including the certifications required from authorities and third parties.

If you have an existing Data Center we can complete an assessment to look at the options & suitability for an upgrade. If you want to move your Data Center we can move it. If you need a rapid deployment Data Center we can design & implement a Tier III unit within 3-4 months for up to 20 racks. We deliver complete documentation & drawings packages including 3D modelling.
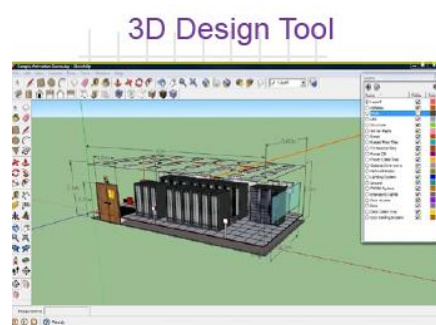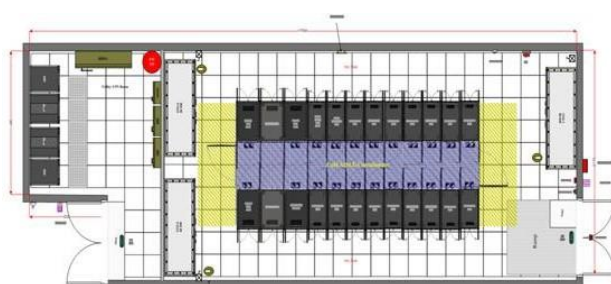
3. PROJECT IMPLEMENTATION

DataValley Project Management Organisation (PMO) follows a phase wise approach for executing our projects, as shown below
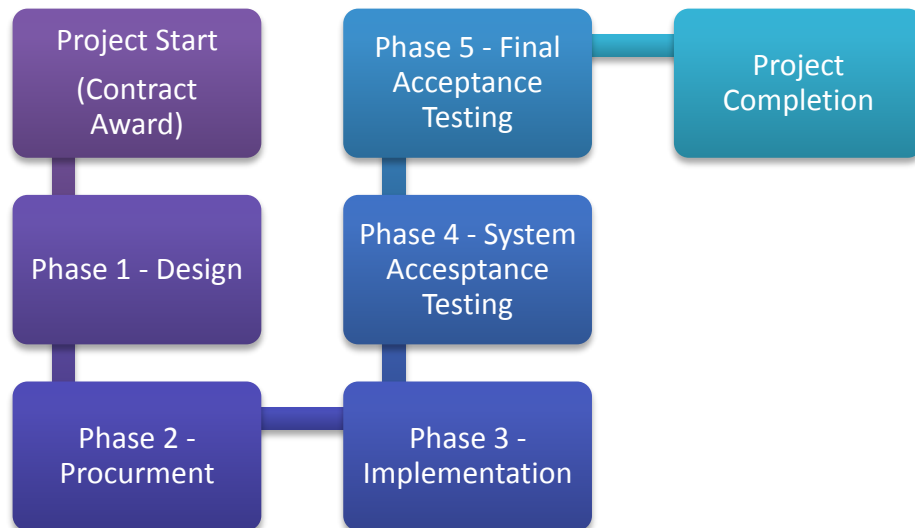
End-to-end Risk Management is accounted for at every step of our project management:

The above shown Phase Wise Project Management approach is explained in the following section in detail.

3.1 PHASE 1 -PROJECT KICK-OFF

The project kick-off meeting will set the framework for the entire life of the project. The following elements will be introduced at the Project Kick-Off Meeting:

3.1.1 Project Organization:

The *DataValley* Project Manager will introduce the key members of the team and their responsibilities
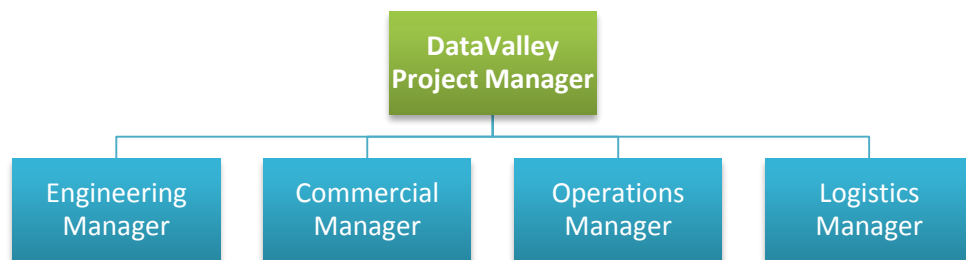
a) *DataValley* Project Manager:

DataValley Project Manager will represent the key Point-of-Contact for CLIENT. The Project Manager will be responsible for the timeliness of the installation of the solution as well as coordinating communication between the other project groups.

b) Engineering Manager:

Engineering Manager will be responsible for providing detailed network designs for each of the CLIENT sites highlighted for expansion and presenting them to CLIENT for approval. The Engineering Manager is also responsible to manage the activities of the *DataValley* installation team.

c) Operations Manager:

Operations Manager will be responsible to coordinate the purchasing and delivery aspects between all suppliers, vendors and the *DataValley* teams.

d) Commercial Manager:

Commercial Manager will be active if the scope of activities or equipment specified is outside the scope of the baseline

contract. The commercial manager will present cost analysis for additional items for approval.

e)   Logistics Manager:

Logistics Manager is responsible to co-ordinate the secure movement of *DataValley* personnel and equipment to each of the sites for development.

3.1.2 Preliminary Project Plan & Ongoing Project Meetings

A tentative project plan will be introduced, which will introduce:

- List of activities

- Timing of activities

- Resources responsible for delivery of activities

The project plan will be negotiated and agreed. Included in this agreement will be a list detailing the order for which each of the CLIENT sites will be addressed.
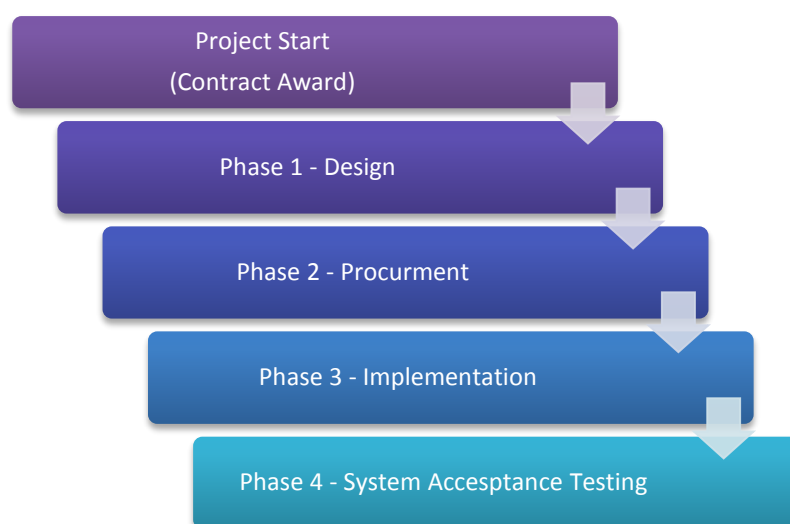
The project plan document forms the baseline for monitoring the entire project. It is the responsibility of the *DataValley* project manager to constantly update it and report against it to the CLIENT regarding areas that are falling behind or external factors that may affect project timelines. A weekly project update will be undertaken between key project personnel from CLIENT and *DataValley*.

The format for the weekly project update will be as follows:

- Review of Progress in relevant project plan items from previous week

- Identify potential road blocks and determine contingency plans

- Discuss actual roadblocks and contingency plan

- Discuss amendments to contractual Statement of Work and agree modifications in a Change Request Process.

- Discuss and agree activities for following week

3.2 PHASE 2 – PROCUREMENT

Upon contract signature, *DataValley* will place purchase orders with the relevant equipment vendors. The procurement phase includes order placement as well as the logistics management of importing equipment to country and subsequent on-site delivery to the CLIENT.

Project Start
(Contract Award)

Phase 1 - Design

Phase 2 - Procurment

Phase 3 - Implementation

Phase 4 - System Accesptance Testing

3.3 PHASE 3 – IMPLEMENTATION

DataValley Implementation Services are ideal for reducing the demand on limited resources. Our system engineers and technicians will ensure that the product is functioning and configured onsite according to the design you provide.

3.3.1 Implementation Service deliverables include:

- Review of the existing design that would be used to build the infrastructure.

- Project Management to ensure successful delivery of the project, including Project Plan and Project Completion documentation.

- Site survey (if applicable) to define and rectify ahead of the installation, any deficiencies or requirements necessary for the installation.

- Creation, verification, and loading initial configurations, pre-provisioning defaults and parameters to ensure basic functionality and end to end connectivity.

- On-Site installation and provisioning, connection to facilities, testing and 'cut-over' per the pre-established schedule and acceptance plan.

- Engineering documentation to reflect the 'as - built' state of the network.

3.4   PHASE 4 - SYSTEM ACCEPTANCE TESTING

A test plan is submitted for agreement with the customer. The purpose of the test plan is to specify and prepare all documents necessary for the system test, to define the test environment, test data and to plan the required resources. The design documents are the basis for the system test. For each functional specification, a test procedure specification will be prepared. The sum of these specifications results in the test strategy, the adaptation and/or supplementation of the master test plan, test data and test tools as well as any further test documents if necessary.

The test plan is executed along with representatives from the customer with acceptance signing authorization.

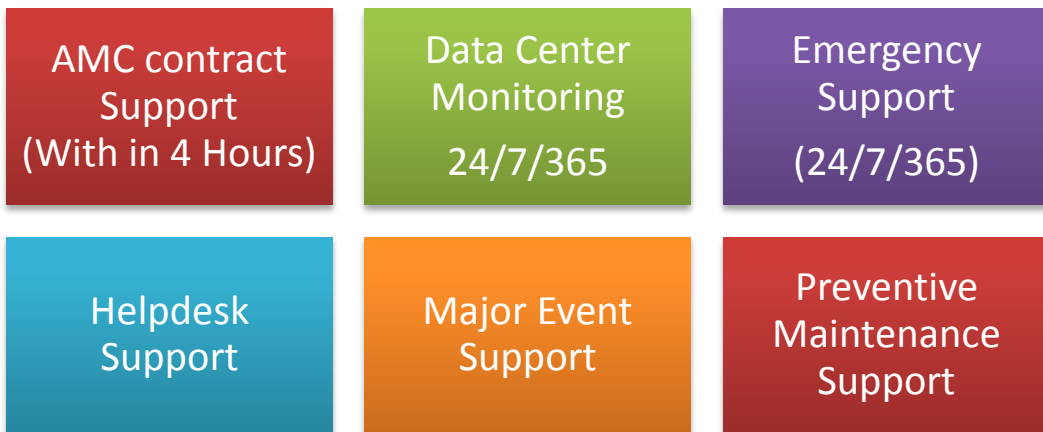## 3.5   PHASE 5 - FINAL COMMISSIONING & HANDOVER

Following successful testing and acceptance by the customer, the system will be ready for cut-over, i.e. go-live.

4. POST SALES SUPPORT

4.1 Technical Support Services

DataValley offers the full spectrum of post sales support services to our customers, dependant on the requirements and scope of the project. We also offer complete Operations and Maintenance Services (O&M) to customers who want a 24x7 operational support, with our on-site and remote teams.

AMC contract Support (With in 4 Hours)	Data Center Monitoring 24/7/365	Emergency Support (24/7/365)
Helpdesk Support	Major Event Support	Preventive Maintenance Support

5. MAJOR TECHNOLOGY PARTNERS

Data Center

Schneider Electric   Schroff   AKCP

APC by Schneider Electric   Tate   AIREDALE air conditioning for every environment   FIREX

Command & Control

CHRISTIE   Extron   CRESTRON

Information Communication Technology (ICT)

CISCO   SYSTIMAX CommScope Prestige BusinessPartner   CONTEG   LEVITON

Surveillance & Security

BOSCH   AXIS COMMUNICATIONS

6. CONTACTS

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