FICOLO OY – Data Center Colocation

Service Description

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1. Overview

This is a service description for Ficolo data center colocation services. The purpose of this document is to provide a comprehensive overview of the data center colocation services to customers as well as end customers of partners using Ficolo as a platform to provide cloud services.

Data center services form the basis of colocation services. Other services provided by Ficolo include managed colocation, managed networking, device layer services, service platforms, storage and backup capacity services as well as value added services such as connectivity, data and network security and installation and expert services. These other services are described in separate documents.

This document describes the data center colocation services depicted as the lowest layer in the figure below.

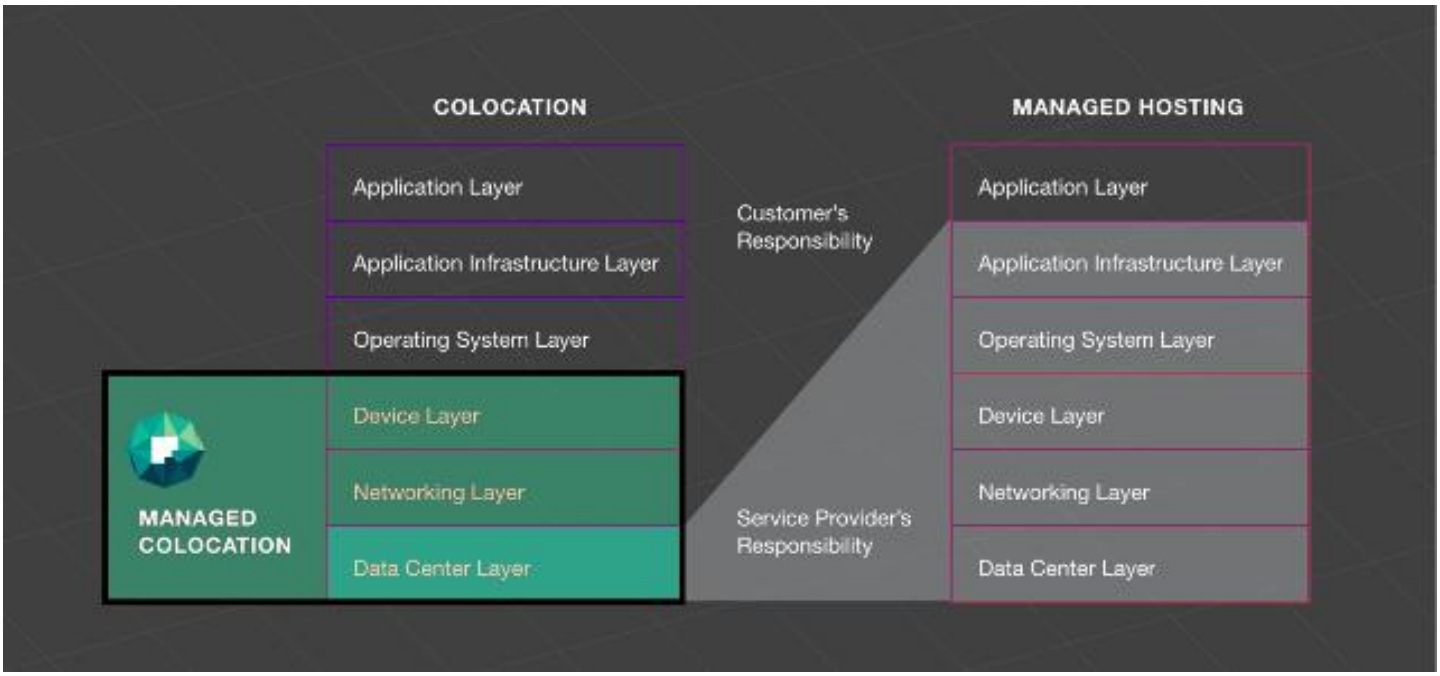

Figure 1. Conceptual presentation of Colocation and Managed Hosting services presented as layers

The colocation data center is built as a secure and monitored facility for ICT devices (such as servers).

2. Service Benefits

Data center colocation means physically placing ICT equipment in a shared environment. This brings a number of benefits such as reduced cost of design, building and maintaining resources by sharing the cost between multiple tenants. Moreover, extensive flexibility in initial implementation of the data center as well as when expanding helps ensure that your ICT solution supports your business appropriately and in a timely manner. Security can still be kept at a high level, with savings available for instance in the cost

of physical security (e.g. access control) for the equipment. At the same time reliability and predictability can be improved.

In data centers there can be significant room for energy savings, particularly in the area of cooling. In addition to supporting your green energy program, the cost savings can be very compelling because more power is typically used for cooling than for running the equipment. With a data center right inside the Finnish bedrock providing a constant low year-round temperature ensures that only a minimum of cooling energy is needed. Saving energy is in the interest of both provider and the Customer. Ficolo uses local wind power and optimizes data center energy usage, making it easy for the Customer to get the savings benefits.

Importantly for many customers, outsourcing data center operations frees resources and improves focus on running your own business. The Customer's IT department can focus on business critical services, while utilizing external resources where appropriate. Software companies and service providers can focus on their own service development without sacrificing agility. Because you can choose the depth of cooperation, you are free to keep or bring back any functions in-house should you want to do so. With Ficolo as a partner you can rest assured that your IT organization can become more agile to constantly align ICT resources with business requirements.

Colocation service benefits

Cost savings

- Turn CapEx to OpEx
- Exploit benefits of scale
- Cost predictability
- Flexible capacity addition
- Enable IT resources to focus on services supporting core business

Customer's role

- Customer can define depth of outsourcing
- Natural track to greater outsourcing
- Highlights role of IT as Change Driver and Design Authority

Risk management

- Secure space
- Solutions guaranteeing high availability in all situations (e.g. Lengthy power loss)

Figure 2. Benefits of Data Center Colocation

Thanks to its unique location, Ficolo can provide data center related operational services at reasonable cost, so you can optimize your IT personnel needs and utilize services only when needed. The data center is located in an underground tunnel network covering 8,500 square meters, which was originally quarried for the Finnish Defence Forces. Because of the location outside the main metropolitan areas, domestic

customers can be offered the same location-based relative competitive advantages that foreign companies derive when they establish a data center in Finland.

Ficolo's data center consists of nine underground halls measuring 500 m2 and 800 m2. Some of the premises are shared and others are dedicated data centers. It is possible to build customized data center modules in the halls for the purpose of creating dedicated data centers, certified IT security rooms or EMP-protected premises according to customers' needs.

Finland offers a safe and predictable political atmosphere, transparent and service provider-friendly legislation, affordable energy prices, availability of green and renewable energy, industry experts, a favorable salary level and general price level, carrier-neutral and competitively priced telecommunication connections with good availability, as well as an ideal geographical location due to a climate and terrain without natural disaster risks.

3. Description of the Data Center Colocation Service

3.1 Data Center Colocation Service Implementation

Data center capacity is provided as a colocation service. Depending on the agreement, either the Customer or Ficolo installs IT equipment in the data center.

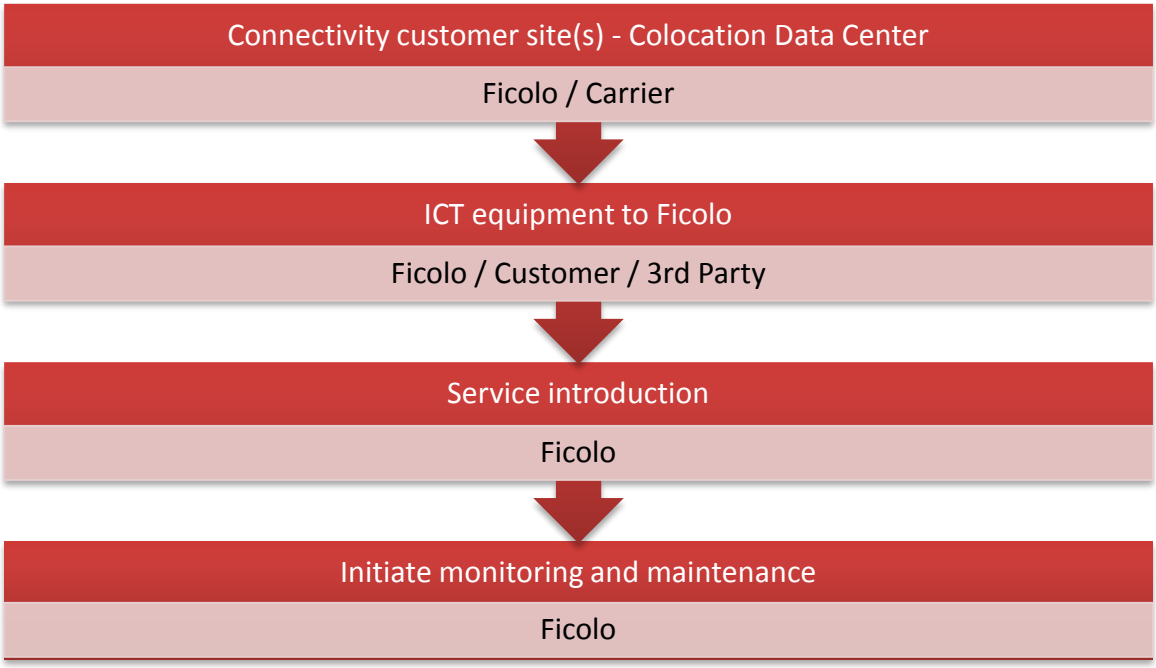

Figure 3. Service Implementation Process

Prior to installation, required data connections are built between Ficolo's data center and Customer's premises either by the customer's carrier partner or by Ficolo as agreed. Connectivity can be established with customer dedicated connections (MPLS, Ethernet VPN, IP VPN, xWDM solutions) or over the Internet. Once the data connection between customer's premises and the data center is implemented and tested, the Customer's ICT equipment is moved and possible new equipment is taken into production.

Responsibility for moving equipment is agreed separately. Service introduction is performed as a separate project. The duration of a relocation project is dependent on the amount of equipment and their location.

Ficolo's colocation service includes a monitored data center service, which can be provided from a shared or dedicated data center room. Ficolo's data center colocation configurations comprise:

- Device units and racks in shared data center rooms. Dedicated cages in shared data center rooms
- Dedicated data rooms with required availability and security levels
- Dedicated (certified) IT-security rooms with optional EMP/HPM protection

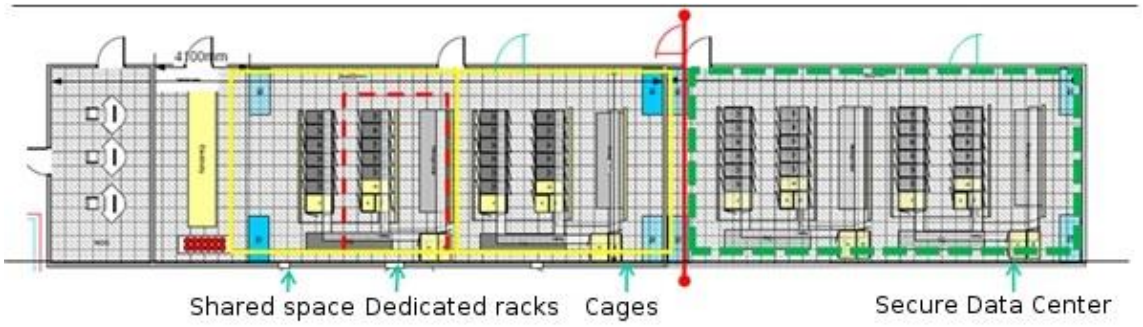

Figure 4. Ficolo shared space, dedicated racks, cages and dedicated secure data center space

Colocation service may include a service package in addition to the monitored data center.

Service introduction is divided to the following phases:

Figure 5. Service introduction phases.

Service introduction phases:

Phase 1 - Definition: ordering the implementation project with customer requirements. A list of items for defining requirements is available in Section 8. **Ordering and Introduction Schedule**.

Phase 2 - Planning: Planning the solution based on order and requirements.

Phase 3 - Implementation: Implementation of the solution based on the requirements.

Phase 4 – Delivery Verification: Provider verification of solution. Once installed, Ficolo technicians test that the solution is functions.

Phase 5 – Service Acceptance Test: Customer solution acceptance procedure. This varies according to the scope of the implementation.

Phase 6 - Introduction: Service introduction (starting production) of the implemented solution

After these stages service introduction is completed and service operation starts.

3.2 Data Center Colocation Service Operation

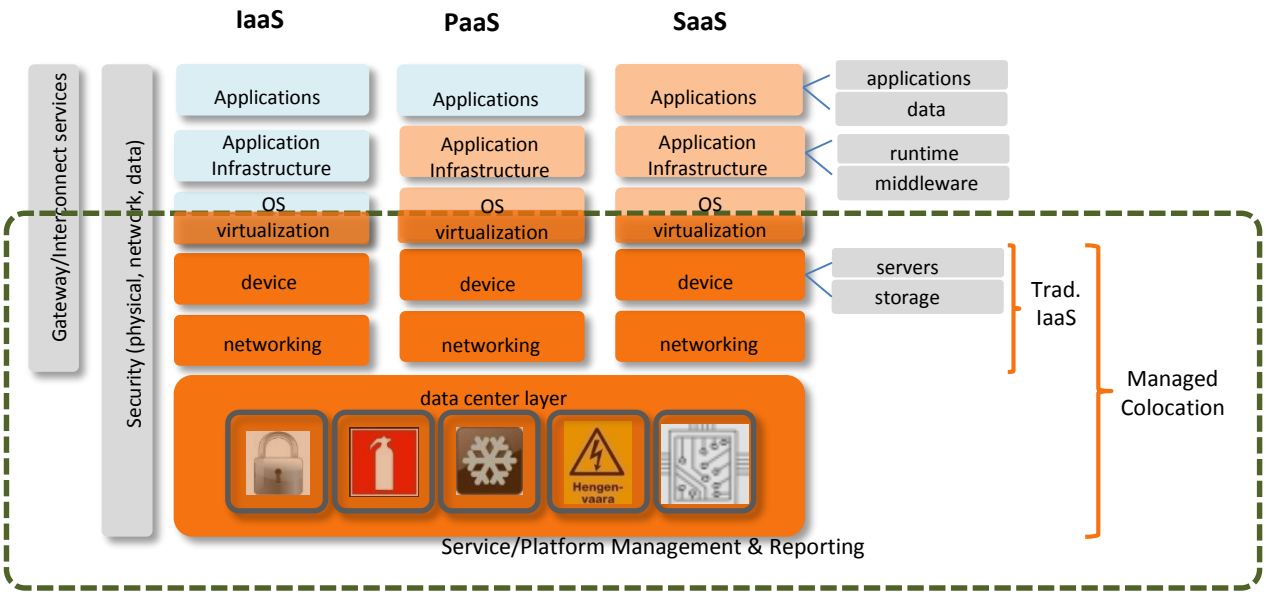

Figure 6. Ficolo As A Service. Colocation and Managed Colocation services.

In the context of colocation and ICT outsourcing, you often see the terms IaaS, Infrastructure as a Service, PaaS, Platform as a Service and SaaS, Software as a Service. Figure 6 above shows a conceptual overview of what this means, showing that the depth of the cooperation is the key defining factor. Here the focus is on the lowest layer, the data center layer.

Data center layer services include the following:

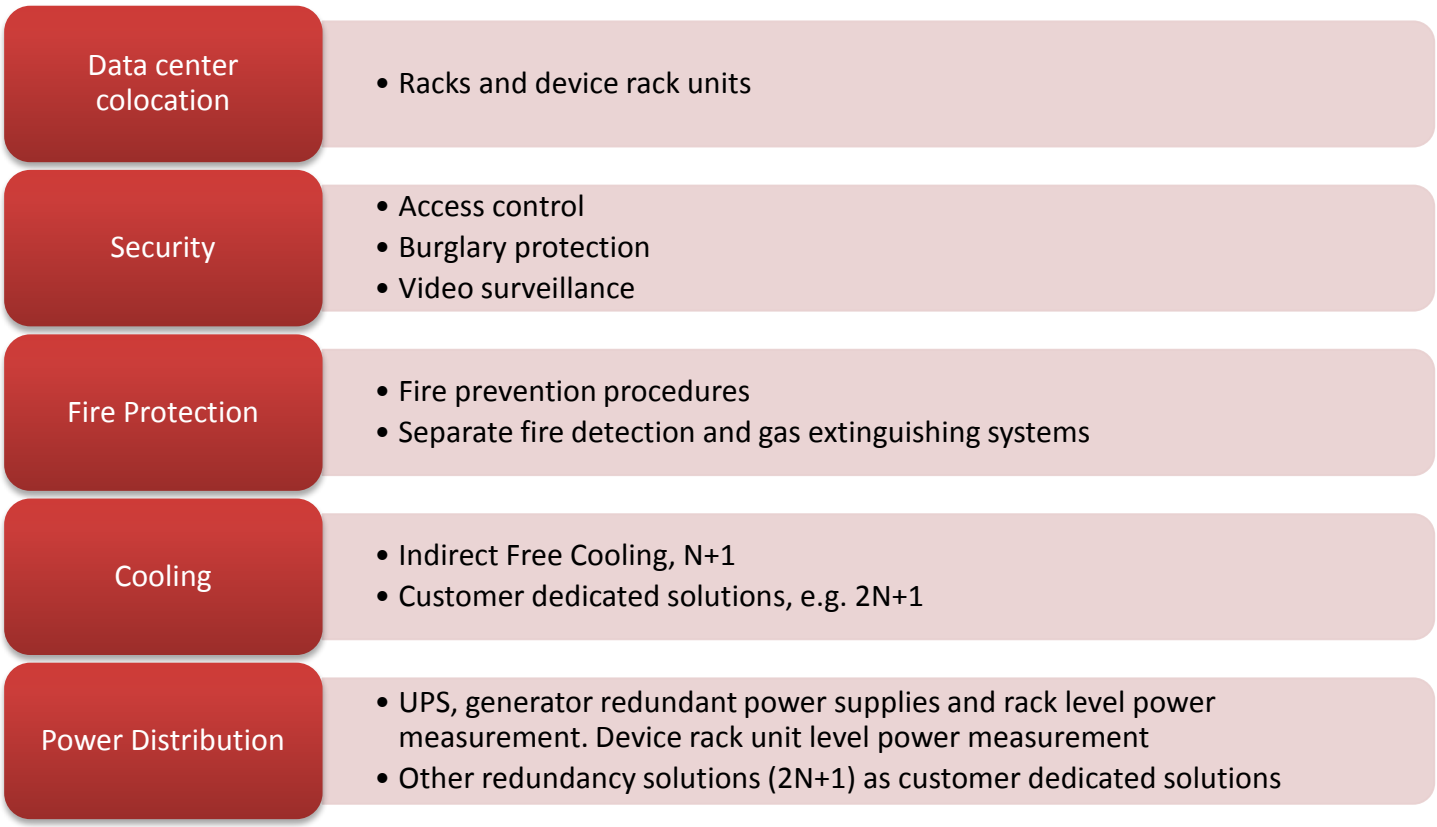

Figure 7. Data center layer services overview.

Data center, racks and device rack units are complemented with security solutions such as access control, burglary protection and video surveillance. Ficolo has on-call duty service as well as security service from a security partner. Fire protection solutions include separate fire detection and gas extinguishing systems and close co-operation with local rescue authorities. Cooling solutions include data center cooling (Indirect Free Cooling, N+1). In addition, customer dedicated solutions also available (e.g. 2N+1). To ensure power distribution, UPS and generator redundant power supplies and rack level power measurement are available in the shared data center. Device rack unit level power measurement is available as an additional service. Other data center redundancy solutions (2N+1) can be offered also as customer dedicated solutions.

3.3 Data Center Colocation Service Maintenance

Maintenance activities start when the implementation phase is complete. The activities include regular scheduled maintenance for all infrastructure and assets. Preventive and predictive maintenance procedures ensure equipment is kept in good working condition. The purpose of the maintenance activities is to ensure reliable operation.

Maintenance activities include checking and servicing:

- Logs
- Temperature
- UPS & Batteries
- Power & data cable physical inspection
- Generator
- Air conditioning and cooling system
- Data center cleaning

3.4 Data Center Colocation Service Monitoring

Appropriate monitoring is key to achieving a controlled environment. Every aspect of the service needs to be monitored to detect deviations. Monitoring results are also key in continual improvement and development efforts, for instance when looking for further efficiencies or further limiting risks.

The following are monitored:

- Access monitoring and surveillance
- Temperature
- Cooling system
- Power and backup system
- Batteries

4. Technical Service Environment

4.1 Supported Environments and Technologies

Colocation data center services can be provided for any of the customer's ICT devices. Typical equipment includes for example servers, storage systems and switches.

4.1 Data Center Environment

Ficolo's colocation data center provides a stable, predictable and future-proof environment for the customer's equipment.

The following is available in the data center:

- Rack space with power and cooling

- To ensure power distribution, redundant power supplies, generators as well as UPS protection is available (N+1). Power measurement is done per rack. Rack unit level power measurement is available as an additional service.
- Data center redundancy solutions (2N+1) can be offered also as customer specific implementations
- Cooling. (Indirect Free Cooling, N+1). In addition, customer specific solutions also available (e.g. 2N+1). Cold and hot aisle solutions available to optimize for cooling efficiency.

4.2 Shared Data Center Facilities

All shared (as well as customer dedicated) space is under video surveillance. The site has burglary protection and access control. Only identified persons have access to the space.

Specifically for customers using shared space the following are available:

- protected power (high voltage ring network, transformers, electrical center, UPS and generator). Ficolo has implemented solutions to improve energy efficiency, e.g. location of the production environment, underground season independent cool tunnels, and indirect free cooling and heat recycling. Ficolo also supports local renewable energy production.

- cooling and condensers for data center environment and CRACs on the fire walls protect each other

- video surveillance with recording, access control system, fire and burglary alarm and air quality monitoring

Several data center standards have been followed when designing the facilities.

Customer specific solutions with high security classification can be implemented according to your requirements.

4.3 Security and Risk Mitigation

Physical access is the most important aspect of security and therefore data center access is strictly controlled. A separate access card, a PIN code and a biometric sample are all required for data center access. Access is granted to authorized persons only. Only a named representative of the Customer may propose granting access for the customer's additional personnel. Ficolo's customer service coordinates controlling physical access using an access control system.

In addition to entry, working in the data center is closely controlled and monitored to prevent unauthorized use. Monitoring and video surveillance also makes it possible to identify all data center visitors in real time and post visit. Camera equipment and locations comply with security requirements.

The data center is located above sea level and humidity and flooding detection sensors are present.

Separate documentation about data center access and working in the data center is available for customers.

4.4 Fire Prevention

Fire detection and control systems are used in all Ficolo data center facilities. At the same time our method of working has been developed to ensure that the risk of a fire is kept at minimum. This is done by adhering to the following policies and methods:

- Access control to prevent unauthorized people near any equipment
- Storage of any combustible or flammable material is not allowed in the data center
- Electrical surge prevention using UPS and batteries
- Overload prevention
- Advanced smoke detection
- Gas extinguishing system
- Fire suppression tanks
- Continuous human monitoring by our personnel

Disaster Mitigation and Recovery services are described in separate documentation.

5. Service Times and Levels

The data center is in operation 24/7. The colocation and managed colocation services or service tasks requiring personnel are produced at agreed times. Service times and levels will be agreed during the contract negotiations process in a separate Service Level Agreement.

Ficolo offers following Service Levels:

- Standard: 8x5 (Office Hours 9-17 Mon-Fri excluding public holidays)
- Exclusive: 24/7
- Custom: Ficolo can offer custom SLA based on customer requirements

6. Service Production

The data and network security plan created by the provider will be used when the service is in production. Operation and customer services organizations manage the services based on agreed service levels.

Responsibilities for different tasks are owned as per the below matrix.

Responsibility	Ficolo	Customer
Providing Data Center Colocation Service	●	
Providing Additional Services	●	
Event Notifications	●	
Service Reporting	●	
Appoint contact person		●
Notifying of device or software changes		●
Maintenance for customer owned equipment		●
Insurance for customer owned equipment		●

Figure 8. Responsibility Matrix

In addition to the items mentioned in the matrix, the service contract may define further responsibilities.

6.1 Provider's Responsibilities

The provider is responsible for notifying and reporting on all the changes or other maintenance tasks affecting the customer's systems or service availability. Provider's Customer Services team is responsible for the customer communication.

Provider is responsible for producing services and agreed additional services based on this service description and Service Level Agreement.

The service level is regularly reported in customer meeting based on agreed schedule. Customer has a right to invite customer meeting when needed. Third party representatives can participate to the meeting if requested/agreed by customer.

6.2 The Customer's Responsibilities

The Customer allocates a named contact person or project manager. A deputy person can be named if needed. These persons are responsible for coordinating the customer's tasks and other responsibilities. The contact persons will also make decisions on accepting additional extra tasks with associated cost or other extra costs required.

The Customer is responsible for notifying provider in case changes to the devices or software related to the provider's services are done.

Customer is responsible for the maintenance and insurance of their devices or devices rented from a 3rd party.

7. Auditing Standards and Customer Compliance

In many lines of business compliance to a set of standards is a requirement. Because Ficolo has the necessary controls and processes in place for standards compliance we provide an easy way to ensure compliance. Separate documentation for standards compliance and auditing can be provided.

7.1 Quality Process

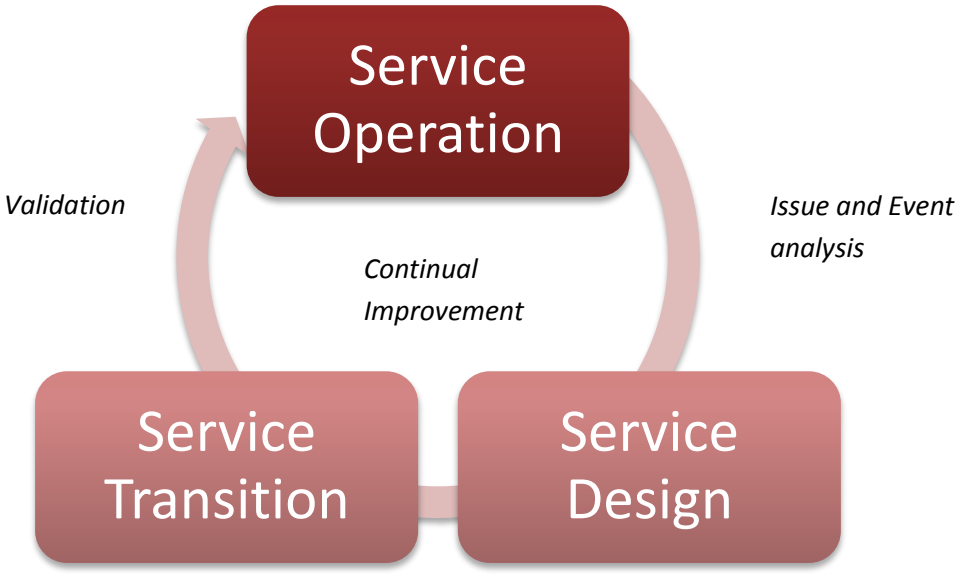

Figure 9. Ficolo Quality Process with Continual Process Improvement

The cornerstones of Ficolo's quality process are proactivity, continual improvement and validation. The purpose is to enable providing continuous high quality service. From operations, basic monitoring data as well as issues and events are analyzed. With this input the quality manager together with field engineers can assess the need for improvements. Constant monitoring along with robust validation help ensure that the highest possible quality services are provided.

8. Ordering and Introduction Schedule

The timeframe for implementation and introduction of services is always agreed with the customer. A setup fee will be charged as agreed in the colocation agreement. Normally Colocation service invoicing is based fixed monthly fee and possible additional charges based on additional services or equipment.

Colocation-services and agreed additional services will be planned and implemented in an implementation project, which requires approval from both parties. The project will be started, when customer has ordered services and contract has been signed. The project will be implemented together

with the customer, Ficolo's project manager and Technical Account Specialist and additional project resources.

Information to be collected for the project planning includes:

Item
Required # of rack units or rack capacity and possible special requirements
Requirements for physical access control Arrangements for remote access
List of devices including device features such as power requirements, physical sizes and interfaces,
Requirements for the network infrastructure and additional services (such as firewall service)
List of dependencies to other devices and systems

Figure 10. Table of information for project planning

9. Deliverables

The deliverables of a Data Center Colocation service vary, but at a minimum typically consist of:

- Space
- Power with 3-6 fuses
- Shared data center services:
    - Cooling service
    - Security service
    - Connectivity service

Other than above mentioned deliverables are separately agreed in the contract.