

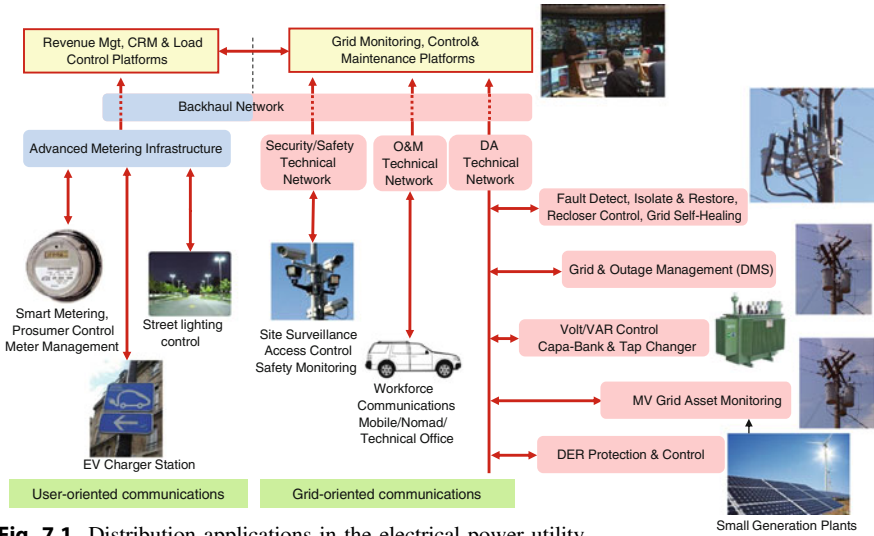
Communicating applications in the distribution segment of the power system can be considered as being no different from those described in the previous sections: substation-to-substation, substation or field device to a control platform, and field to office. However, a number of specificities need to be taken into account when designing communication solutions.

- Potentially communicating devices and sites are orders of magnitude larger in numbers and generally dispersed over considerably smaller distances.
- Communicating applications are only emerging with little legacy to be taken into account.
- The electrical grid is permanently changing, communication need to be considerably more agile.
- Time and availability constraints, although present, are less severe than in the higher level grid.
- Distribution system end points are partially outside utility boundaries, at power consumer or dispersed generator premises.

The boundaries of asset ownership and responsibility in the distribution segment depend largely upon the power delivery model and the partitioning of roles in the deregulated context. In very simple terms, one can distinguish (Fig. 7.1):

- **Customer Communications**—Smart metering, customer relations, and demand response
- **Distribution Grid Automation**—Supervision and control of grid's capability to deliver power, DMS/SCADA, Volt-VAR Control (capacitor bank and tap changer commands), FDIR (fault detect, isolate and service restore)

In some cases, common communications can be used for services in the two segments (e.g., transformer monitoring and customer metering) but the applications



**Fig. 7.1** Distribution applications in the electrical power utility

may depend on different companies. The activities may also be separated in future rendering the investments uncertain.

Another distinguishing factor between customer communications and grid automation resides in their tolerance to service outages. Typically metering services can quite easily accept communication service outage consequent to long power outage and can therefore use public communication services. Grid automation, on the other hand, requires extremely high service availability resulting in dedicated communication services.

Common backhauling communications can often be used for both segments using a broadband dedicated telecom infrastructure.