Benefits of using Cloud Services:

Availability, scalability, reliability, predictability, security and governance, and manageability.

High Availability (HA)

Ability of a system to remain operations to users during planned or unplanned outages. It is important to remember that it is near impossible to have 100% availability.

Planned outages include operating system security patches, application updates, hardware replacement, migrating to a new hosting provider.

Unplanned outages include hardware failure, network disruptions, power outages, natural disasters, cyber attacks, software bugs, poor scaling/architecture design.

Methods to mitigate planned outages:

1. Gradual deployment strategy (do not deploy to all the servers at once). Start with handful servers and gradually grow deployment.

2. Testing and monitoring deployment (errors (files missing, corrupted) are increasing over the time).

3. Easy rollback plan (have a plan to go back if there are major issues). MS Azure has tools to make rolling back easy.

4. Small deployments (less features and less changes in every deployment)

5. Frequent deployments (become expert at deployments)

6. Automation (instead of manual deployments, follow standards)

Methods to mitigate unplanned outages:

1. Every single core component has redundancy (we will not have a single server, single web app, single network, single region dependency for application). This may increase the cost, but it will help to mitigate the unplanned outages.

2. Use Azure's built-in features for availability: Availability Sets, Availability Zones, Cross-Region Load Balancing/Front Door.

3. Constant health monitoring/probes (real time monitoring systems).

4. Automation (automate fall back strategies).

5. Strong security practices (for cyber attacks, ...).

6. Be geographically distributed.

7. Have a disaster recovery plan (similar to fire evacuation plan).

8. Test that disaster recovery plan (similar to fire drill).

9. Load testing (this for scaling). Identify where are the capacity limits. This helps to identify bottleneck and fix them.