I'll express my understanding about my PI's concerns about the system potentially crashing if all participants submit their surveys at the same time, then reassure my PI that using AWS's cloud infrastructure can prevent such issues and ensure smooth operation during high traffic periods.

- **AWS Auto Scaling**: This feature automatically adjusts the computing capacity to maintain consistent performance. During times of sudden spikes in survey submissions, AWS Auto Scaling can dynamically launch additional instances to handle the increased load and then scale down when the submissions decrease *(AWS documentation - What is Amazon EC2 Auto Scaling, https://docs.aws.amazon.com/autoscaling/ec2/userguide/what-is-amazon-ec2-auto-scaling.html)*. This elasticity ensures that the infrastructure can cope with peak loads without human intervention.
- **AWS Lambda and Elastic Load Balancing**: Leveraging AWS Lambda for processing survey submissions allows each submission to trigger a separate instance of your function, ensuring that the system's performance remains stable even under heavy loads *(AWS documentation - What is AWS Lambda, https://docs.aws.amazon.com/lambda/latest/dg/welcome.html)*. Elastic Load Balancing optimally distributes incoming traffic among Lambda functions, which prevents any single function from becoming overwhelmed and ensures smooth handling of requests *(AWS documentation - What is Elastic Load Balancing, https://docs.aws.amazon.com/elasticloadbalancing/latest/userguide/what-is-load-balancing.html)*.
- **Amazon S3 and DynamoDB**: For data storage, Amazon S3 is used to store raw survey data, providing highly durable storage that automatically replicates data across multiple physical locations *(AWS documentation - What is Amazon S3, https://docs.aws.amazon.com/AmazonS3/latest/userguide/Welcome.html)*. Amazon DynamoDB is used for real-time data access needs, storing processed results with automatic scaling and performance management *(AWS documentation - What is Amazon Dynamo DB, https://docs.aws.amazon.com/amazondynamodb/latest/developerguide/Introduction.html)*. This dual approach leverages S3's durability and DynamoDB's low-latency data access, ensuring no data is lost and all data is quickly accessible.

This modern cloud-based architecture offers both scalability and reliability, ensuring that the research data is secure and consistently accessible.