Improving Incident Management and Response: Utilizing Innovative Data Collection, Management, and Reporting Techniques

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Spills and emergency responses generate large amounts of observational data. Successful incident responses require advanced data capture and management solutions along with near or real-time visualization and reporting of data. In this presentation, we provide project examples and best practices derived from recent incidents where Ramboll deployed innovative solutions to address our clients' needs. Improved digital data collection methods using products such as Esri Field Maps, QuickCapture, and Survey123 have contributed greatly to real-time decision making for incident response situations. Having the ability to locate and capture data quickly and easily then combine logic and automation techniques assists greatly in making real-time response decisions. We also discuss the use of Unmanned Aerial Systems (UAS) as innovative data capture solutions that are used when field personnel cannot be deployed due to inhospitable conditions or where safety issues are present.

Advancements in data collection methods and workflows demand modernization of data management and reporting strategies. This includes identifying the appropriate database types and storage methods that are critical to the real-time reporting function. We discuss how the selection of data storage strategies may change based on the overall reporting goals for the project. We will also discuss how webhooks like Power Automate and Integromat and other automation tools such as JavaScript integration can be used to extract, transform, and send real-time data to many different databases or applications like Microsoft Excel or Outlook.

Once a functional database and storage system has been chosen, using the right reporting tools to interpret your data is crucial to a response. Advancements in real-time reporting applications make it possible to view and share data quickly and easily with anyone. Deciding which reporting method is right for a response depends on the available data collection tools and end-user goals. We discuss reporting methods including Esri applications and dashboards along with Microsoft Power BI which can allow users to interact with live datasets both geographically and analytically. ESRI offers several different applications to display and interact with data including Story Maps, Web AppBuilder, Experience Builder, and Dashboards which can be used anywhere on most desktop, laptop, or mobile devices.

Ramboll has used many of these tools and methods in emergency response scenarios. For instance, Ramboll worked with an "insurance client" to quickly report, analyze, and visualize the costs of claims. We used ArcGIS Online and its suite of apps to visualize the response area. Ramboll connected several different databases to Power BI to analyze the claims in several different ways. Another added benefit of handling data with these methods is the ability to have anyone in the world share their skillset with the response, not just the local team in a command center. Ramboll uses these technologies as part of spill planning to predict potential areas where spill products may transport or collect to facilitate quicker response should a spill occur. Using mobile applications, ArcGIS Online, and webhooks; data are collected and then quality checked before the field team leaves the response segment. This ensures that the response has the best and most accurate data. Additional examples and innovations will be provided during this presentation.

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