The existing methods of conducting risk assessments using risk matrices in India, particularly in coal mining, face several challenges that highlight the need for digitalization. Here are some key issues:

1. **Subjectivity and Inconsistency**: Traditional risk matrices often rely on subjective assessments of likelihood and impact, leading to inconsistent evaluations. This subjectivity can result in misclassification of risks, where similar risks may receive different ratings based on individual judgment rather than standardized criteria[5].

2. **Limited Data Utilization**: Current practices may not effectively leverage available data for risk assessment. Many organizations still use manual processes that do not incorporate real-time data or historical trends, which can lead to outdated risk evaluations and ineffective mitigation strategies[2][4].

3. **Complexity in Risk Calculation**: The mathematical simplicity of multiplying likelihood and impact to derive a risk rating (i.e., $$ \text{Risk} = \text{Likelihood} \times \text{Impact} $$) can mask the complexities involved in accurately assessing risks. This oversimplification may overlook critical nuances, particularly in high-stakes environments like coal mining[3][4].

4. **Inefficiency in Updates and Revisions**: Traditional methods often require significant manual effort to update risk assessments, which can lead to delays in addressing emerging risks. Digital systems can automate these updates, ensuring that risk assessments reflect the most current conditions and information[2][3].

5. **Inadequate Reporting and Communication**: Manual processes can hinder effective communication of risks across teams and stakeholders. Digital tools can facilitate better reporting mechanisms, making it easier to share insights and action plans related to identified risks[4].

6. **Regulatory Compliance Challenges**: In India, compliance with safety regulations is critical, yet traditional methods may struggle to keep pace with regulatory changes. Digital solutions can streamline compliance processes by automating documentation and ensuring that all safety protocols are consistently followed[1][2].

These challenges illustrate the pressing need for digitalization in risk matrix calculations and overall SMP management in coal mining operations in India, enhancing safety, efficiency, and compliance.

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