Illuminating Black Boxes v.1

Types of Black Box	Description, Examples	Current Methods of Illumination	Comments
What	These are tangible outputs of work. Perhaps a harmonized dataset, an algorithm or analytic pipeline, a publication or experimental result.	Presentations Publications DOIs (Digital Object Identifiers) FAIR Data	We try to illuminate the "what" mostly by talking about it - through presentations and publications, but this is slow and inefficient and doesn't answer all the questions people may have. Recent progress has been made with DOIs and FAIR Data standards to try to create more granular and structured ways to illuminate the "what," but these are just indexing strategies and useless if not paired with high-quality content and metadata.
Who	These are the people, teams, and organizations involved in different aspects of the work. It's not uncommon in large-scale projects for participants to be unclear on who else is involved. Even if the set of participants is made clear, the people themselves are often still black boxes, with others unclear on their role, expertise, and reason for participating.	Meetings, Conferences Membership Lists Organization Charts Resumes Reputation	We try to illuminate the "who" boxes mostly by getting people together to talk. When that's not possible or scaleable, we rely on poor representations like membership lists or org charts, and we rely on people's reputations and resumes to help us understand what they offer.
How	These are the methodologies and processes involved in the work. This might be a very specific and low-level task like a data-cleaning pipeline, or a very high-level process like the way in which the leadership of the collaboration selects certain results for implementation in the field or for publication.	Electronic Lab Notebooks Open Science Tools (Synapse and OSF) Process and System Diagrams Dataflow Programming Environments	This area seems to be one of the most in-demand areas for illumination. There is a lot of technology being developed to help illuminate how things are done, especially with an increasing desire for reproducible science.
Why	Motivations	Boundary Organizations	I think this is one of the most neglected types of black box. The idea of "co-production of science" still seems relatively new, and we still seem to have a hard time getting all the different stakeholders to participate together effectively, partially because their motivations for doing so are so different.