Section 1: Week 2: Organizational Data Management Problems

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Organizational Data Management Problems

Educational institutions need to maintain student rostering information, such as the class enrollments and the instructional hierarchy of their courses. In some instances, these institutions must associate their rosters with parent organizations, such as county and state districts. Specific aspects of these hierarchical structures are made available to various third-party providers that use these feeds to expose an ecosystem of (1) personalized student learning and (2) teacher dashboarding and (3) classroom analytical tooling.

Student enrollments are not static, and mechanisms need to exist for notifying partners of these changes. However, many schools lack sophisticated processes, and limited standardization exists between organizations (Herald, 2016). This restriction causes these notifications to become semi-structured with an inconsistent selection of entity identifiers. For instance, the same user might be known in different systems as Jim Smith, Jimmy Smith, and James Smith. Their student identifier (primary key) might be unique within a given school (local context) but overlap at the district level (global context).

Parents, administrators, and legislatures have concerns around their privacy of student’s information (Regan & Jesse, 2019). Regan and Jesse state that federal regulators oversee sharing between organizations using powers granted under the Family Educational Rights and Privacy Act of 1974 (FERPA), Children’s Online Privacy Protection Act of 1998 (COPPA), and related laws. These protections introduce a notion of partially-trusted data sharing, which adds another level of complexity across EdTech data management.

These constraints and requirements, turn a relatively simple concept into a partially-trusted heterogeneous multi-publisher/multi-consumer big data management scenario.