Enhancing data consistency in ATLAS and CERN HR databases through automated synchronization

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Management of CERN personnel data - Foundation

Centralized database used throughout CERN

Contains personal details, employment history, performance evaluations etc

Data propagates to other systems, but access is limited to Human Resources
Management of CERN (ATLAS) personnel data - ATLAS Glance

System with its own database used to manage **ATLAS specific data**

Employment data, such as dates, affiliation, profession etc

Used by ATLAS members for data visualization/updating
Current workflow for different employment-related processes

Registering a new member

- Team leader fills pre-registration form
- Pre-registration is approved
- Members’ data is automatically inserted into Foundation database
- Foundation’s data is used to register member in Glance

Updating contact data (office, mobile or phone)

- Member request update of contact data
- Update done in Foundation
- Update done in Glance to match what was set to Foundation

Updating employment end date

- Team leader updates employment’s end date in Glance
- Email alerting about this modification is sent to secretariat
- Date in Foundation is set to match Glance’s

Problems on how ATLAS employments are managed today:
- Intense work: multiple registrations and updates done within a day.
- Manual labor makes it prone to error, leading to desynchronization between databases.
Improving data consistency for each process

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How to enhance processes:
- Streamline data updates in Glance and Foundation databases through automated synchronization.
- Definition of single source of truth.
Establishing a Domain-Driven-Design layered architecture

Presentation layer
- Accepts user commands
- Presents information

Application layer
- Creation and retrieval of domain objects
- Satisfies user commands (‘actions’)

Domain layer
- Core business logic

Infrastructure layer
- Database transactions

Tools and technologies used

- SQL procedures (pushing to external DB)
- Database views (pulling from external DB)
- PHP (backend)
- PHPUnit (framework for test coverage)
1. Secretariat receives email alerting about new pre-registration document.
2. Document is reviewed and approved.
Registering someone in ATLAS: how it’s done today

3. Member’s data enters Foundation.
4. Secretariat registers members to Glance.
Automating the registration of new ATLAS member

- Cronjob to fetch periodically new approved pre-registrations
- PREG entry with member ID and professional data
- Gathers rest of member data from Foundation through view
- Registers member to ATLAS or creates new employment record
- Maps professional data between PREG and ATLAS

Cronjob to fetch periodically new approved pre-registrations

PREG entry with member ID and professional data

Gathers rest of member data from Foundation through view

Registers member to ATLAS or creates new employment record

Maps professional data between PREG and ATLAS
Automating the registration of new ATLAS member

Cronjob to fetch periodically new pre-registrations

Registers member to ATLAS or creates new employment record

Gathers rest of member data from Foundation through view

Maps professional data between PREG and ATLAS

PREG entry with member ID

Cronjob to fetch periodically new pre-registrations

Registers member to ATLAS or creates new employment record

PREG

RegisterMembersFromPREG.php

source/

Member/

Application/

CreateNewEmployment/

RegisterNewMember/

...

Domain/

Employment.php

EmploymentRepositoryInterface.php

Member.php

MemberRepositoryInterface.php

...

Infrastructure/

Persistence/

SqlEmploymentsRepository.php

SqlMemberRepository.php
Contact information: how it’s done today

**Database side**

Data is **always** read and written to Glance’s database.

**Employment**

- Office: ---
- CERN mobile: ---
- CERN phone: ---

**Software side**

Code reflects DB modelling.

Correlation between contact data and employment allows history to be kept.
Reading contact information straight from Foundation

Database side

- Stop reading/writing contact information in Glance’s DB
- Start reading contact information from Foundation’s DB

Software side

- Adapt code to reflect database changes
- Disassociate contact information from employment and make it general to a member
- Change contact fields to read-only

Glance DB

Foundation DB

Glance interface
Dear Institute Representative,

You are receiving this email as a notification that the ATLAS database record of has been modified by .

end date

Kind regards,
ATLAS Secretariat

Value propagated to Foundation (by Secretariat)
Synchronizing employment end dates

We can improve this process by eliminating the manual synchronization to Foundation. Two factors must be taken into account:

- CERN statuses¹ and management responsibility
  - ATLAS Secretariat: EXTN and PART | Glance can update
  - Users Office: USER, PJAS, COAS… | Glance can't update
- Duration of contract: CERN and ATLAS have different rules (CERN contracts cannot last longer than 5 years).

**Different algorithms** had to be established for **each scenario**.

¹A CERN status is a classification used by the organization to indicate an individual's relationship with it. It includes categories such as staff members, fellows, technical and summer students, and external personnel.
Synchronizing employment end dates - pushing data to Foundation

SQL procedure used to push end date data to Foundation

```
BEGIN;
API_FENCE.SET_PARTICIPATION_END_DATE(
  (in_participant_person_id) => 123456,
  (in_experiment_name) => 'ATLAS',
  (in_institute_code) => '0123',
  (in_date_from) => to_date('2023.01.01', 'yyyy.mm.dd'),
  (in_date_to) => to_date('2024.12.31', 'yyyy.mm.dd')
);
END;
```
Where we are and next steps

- Automating new members registration
- Setting single source of truth for contact information
- Synchronizing end date updates
Thank you!

Any questions?

Other Glance presentations @ CHEP 2023:

The ALICE Glance Service Work system
Jomar Junior de Souza Pereira | 08/05, 15h | Track 8

The ALICE Glance Membership System
Jomar Junior de Souza Pereira | 09/05, 15h30 | Poster 13

Iterative and incremental development of the ATLAS Publication Tracking system
Ana Clara Loureiro Cruz | 09/05, 14h | Track 5

Glance Search Interface
Carlos Henrique Ferreira Brito Filho | 09/05, 14h30 | Track 5

The migration to a standardized architecture for developing systems on the Glance project
Carlos Henrique Ferreira Brito Filho | 09/05, 14h45 | Track 5

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