

# Multinational In-Depth Accident Data: From Concept to Reality

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**Abstract** - While it is important to track trends in the number of road accidents in different countries using national statistics, there is a need for data with more detailed information, so called in-depth accident data. For this reason, several accident data projects emerged worldwide in recent years. However, also different data standards were established and so comparative analysis of international in-depth data has been very hard to conduct, so far. This is why the project iGLAD (Initiative for the Global Harmonization of Accident Data) was established and created the prerequisites for building up a standardized dataset out of the common denominator of different in-depth accident databases from Europe, USA and Asia. In the first phase, the project received funding from ACEA to compile an initial database. To accomplish this, a suitable data scheme has been defined, a pilot study has been conducted as proof of concept and the recoding of the first common data base has been initiated. Also, to prepare the project for its self-supporting continuation in the next years, a business model has been developed. This paper reports the history and status of the project, the current challenges and the creation of a capable consortium to maintain the data. In mid-2014, the initial database containing 1550 cases from 10 different countries will be completed and a first detailed view on this data will be possible.

## 1. INTRODUCTION

Since its start in late 2011, the iGLAD project (initiative for the global harmonization of accident data) has come a long way. The goal of the project is to build up a database of so called in-depth accident data on an international level. While most of the countries worldwide provide basic national statistics about the number of road fatalities or injured persons on a very high and aggregated level, in-depth data provides details about single cases, their environment, participants, collisions, injuries and safety systems. So far, no data that can be compared between different countries worldwide or even is in the same data format has existed. The iGLAD project took this momentum and strives for a uniform and international in-depth accident database, which is build up from the bottom on the basis of already existing databases. This is accomplished by creating a well-defined and simple layer on top of all participating databases, which serves as a common denominator of them. A more detailed description of the technical aspects can be found in [1]. This paper reports about the status of the project and the current organizational setup.

## 2. HISTORY

iGLAD was initiated by Daimler AG, ACEA and different research institutes and announced as a working group at the FIA Mobility Group in October 2010. Supported by FIA and ACEA, the goal of the group is to define a common standardized accident data set as an effective foundation for developing and measuring road safety policy endorsements and interventions. It shall also establish how this data set helps to achieve the goals of the “European Road Safety Action Programme” [2] and the „Decade of Action for Road Safety“ [3]. iGLAD was confirmed by the FIA Manufacturers Commission in March 2011.

After presenting the basic concepts of iGLAD to NHTSA/NCSA, especially the NASS group in April 2011 and at the VDA congress [4], the project kick-off meeting followed on 30 September 2011 at ACEA, also marking the beginning of common and cooperative tasks of FIA and ACEA within the iGLAD project. One such task is a project assigned by FIA to analyse the traffic safety data situation in low-income and emerging countries, complementing the efforts of ACEA which initially address in-depth projects in higher and middle-income countries.

The first iGLAD working group meeting in March 2012 comprised a more detailed discussion on the common data scheme and steps necessary for a standardized data set. The first preparatory steps were accomplished in 2012, a study has been conducted by FIA/CEESAR on the worldwide existing and available accident databases. Meanwhile, a common data scheme has been drafted and as a proof of concept, a pilot study has been conducted where each data supplier converts a small set of accidents into the current version of the common data scheme data. This should show the feasibility of the approach and give a small preview of the resulting data set that could be provided by the iGLAD project. The nine countries taking part in the pilot study were: USA, India, Germany, Sweden, France, Spain, Austria, Poland, and Italy.

By end of 2012, the basic project setup had been accomplished and first technical and organizational issues had been solved, so that the first project phase could be started. Target of phase 1 was to build an initial database with at least 100 cases per country. Phase 1 should be finished by mid of 2014. The next section gives more details about the work accomplished in phase 1 and the current status of the project.

### **3. STATUS**

After preparatory work in 2012, phase 1 of the project started in 2013 having a first tangible dataset as a goal. This time, ten countries were ready to deliver data in the demanded extent and quality. Estimates of the recoding effort showed that substantial funding was needed to accomplish the data processing. Appropriate funding was applied for at ACEA and it was granted under the condition that the project would be able to run in a self-contained mode after the initial ACEA funding. So, an effective business model had to be developed enabling iGLAD to run in future project phases without the need for funding from third parties. A separate task force was formed to find a balanced solution where all different roles in the project with all possible combinations were considered. The resulting business model is detailed in section 4. In the course of the first project phase, the following goals were accomplished:

- Common Data Set has been defined as the minimal set of data to collect for each case
- Codebook has been written for the Common Data Set
- Consortium Agreement has been written
- Sampling procedure has been defined
- Recoding data into the initial database has been started

At the time of this writing, the recoding and merging process for the initial database is finished by 80%. Figure 1 shows the data providers and number of cases for each country that comprise this dataset. A total of 1550 cases have been achieved provided by the following organizations:

VUFO GmbH and BASt (Germany), Applus IDIADA Group (Spain and Czech Republic), Uni Firenze (Italy), Uni Adelaide (Australia), JP Research (India), NHTSA (USA), LAB (France), SAFER (Sweden), VSI at Graz University (Austria).

Further organizations that currently actively participate in the project are:

FIA, ACEA, Daimler (Germany), Renault (France), Volvo Cars (Sweden), CEESAR (France), BRSI (Belgium), KATRI (Korea), CDV (Czech Republic).

### **4. ORGANIZATIONAL ASPECTS**

Bringing a large number of organizations together and building up a common and working project structure is quite a challenging task. This is especially true, when no external funding is available and the group should continue without the coordination by an umbrella organization. As iGLAD currently is in the transition process to reach this target, it is worthwhile to look more closely at how this will be achieved.

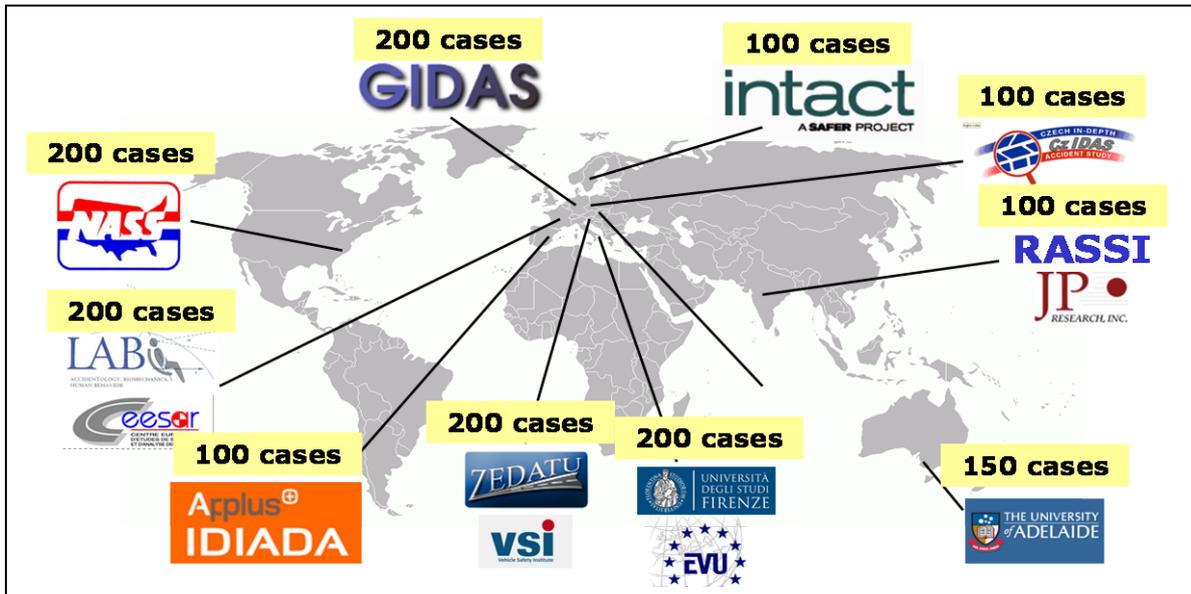


Figure 1 – Overview of countries and number of cases for initial database of phase 1 (2013).

## Project structure

The transition from a funded project in phase 1 to a self-contained project in phase 2 needed some careful preparation. As there are many partners in the project with very different prerequisites, some interesting constellations appear. The biggest challenge was to find a structure that could deal with the flow of money and data within the project. For reasons of simplicity it was decided not to create a new legal entity, but to find a project partner that would be able to do the administrative work, which was hence named the Administrator. In detail, the tasks of the Administrator are:

- Creation of master account and debiting / crediting accounts within master account.
- Manage contracts with project partners. All partners (members and data providers) receive contracts on a yearly basis. The iGLAD Administrator serves as the contracting partner in all contracts. The iGLAD Administrator needs to track that all partners received contracts and manages the returned signed contracts.
- Yearly Invoicing to iGLAD members. Send out invoices to iGLAD members and keep track of the payment and incoming money.
- Conduct payment of iGLAD data providers. Payments of the data providers need to be conducted in time according to the amount of data send from the data providers. Maintain a balanced budget in the non-profit spirit. Propose membership fee adjustments when necessary.
- Record account management expenses and do housekeeping and quarterly balance reporting.
- Merge data samples from providers into iGLAD database. The data samples generated by the data providers need to be collected and added to the already available cases in the iGLAD database.
- Host a webspace to provide access to iGLAD database. A webspace needs to be provided by the iGLAD Administrator where the iGLAD database is stored. A password protected access for each iGLAD member to this webspace needs to be set up. Any changes in the list of iGLAD members have to be reflected in the access rights of the webspace.

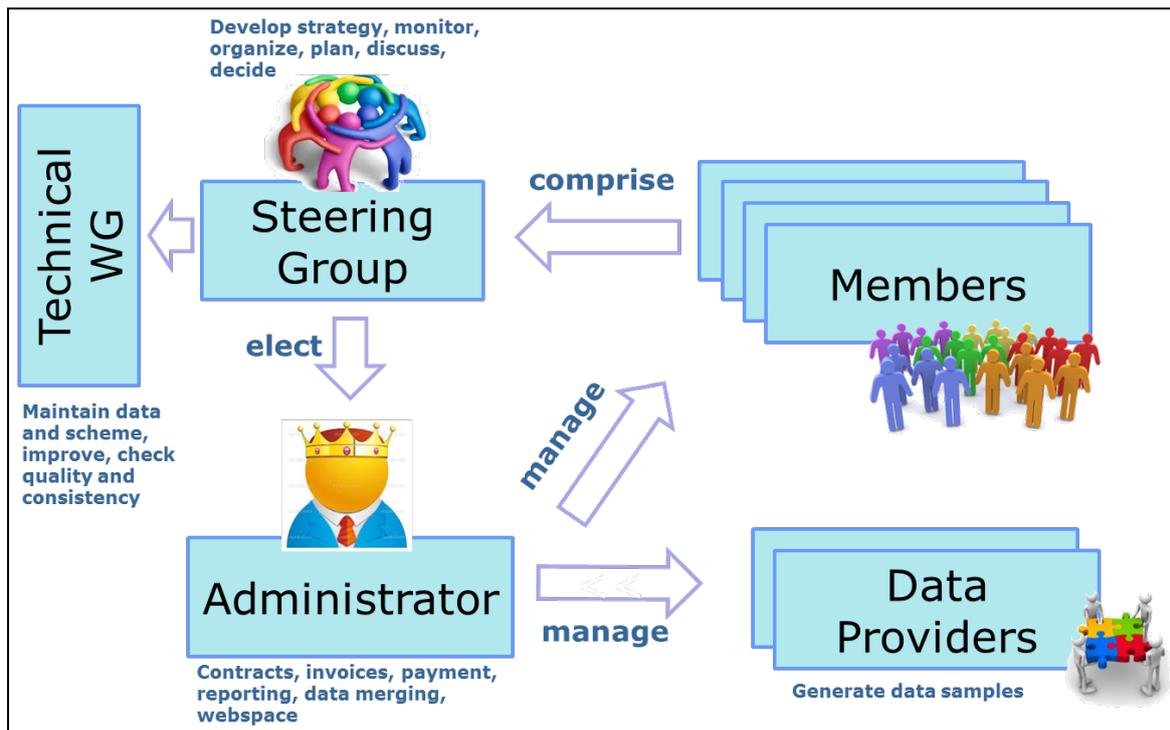


Figure 2 – Organizational structure of the project for phase 2 (2014+).

Of course, the whole project needs guidance by a central group which reflects the interests of the members and the evolvement of the project, which is the Steering Group of iGLAD. In detail, tasks of the Steering Group are:

- General issues, rights and duties
  - Constitution of the Steering Group members and renewal procedures
  - Legal procedure management
  - Main targets and role frame definition and enforcement
  - Reporting to the assembly
  - Public relationships, dissemination and special external agreements
- iGLAD membership regulation
  - New membership acceptance, procedure and control
  - Data usage regulation
  - Communications to the stakeholders
  - Penalties and dismiss members procedure
- Database management
  - Subcontracting procedures and control issues
  - Technical issues management
  - Quality control procedure
  - Data acquisition / sharing procedure
- Meetings
  - Meetings definition (Technical WG, Steering committee, Assembly)
  - Data and venue organization and communication
  - Minutes and ToDo list control
- General management
  - Administration and secretary issues
  - Dissemination

Additionally to the Administrator and the Steering Group, a separate group is needed to care about the technical details. This group reports to the Steering Group and is largely comprised by representatives

of the data providers, but also consists of other members of iGLAD and is called the Technical Workgroup. In detail tasks of Technical Working Group are:

- Maintain common data scheme
- Maintain codebook
- Provide technical background
- Answer questions
- Provide expertise for coders
- Best practices, guidelines
- Provide common tools
- Methods of data exchange
- Integrity, plausibility, quality checks
- Sampling and extrapolation techniques

Figure 2 shows an overview of the organizational structure with the different groups and their relationships. The organization that acts as the Administrator has been elected by the current iGLAD Working Group out of six candidate organizations. The result of the election was that the Chalmers University in Sweden will take the role as the Administrator for the coming years. Also, the director of the VUFO GmbH in Dresden in Germany, Dr. Lars Hannawald, has been appointed as the head of the Technical Working Group. The formerly acting iGLAD Working Group currently serves as the intermediate Steering Group as there are no official members, yet. So, the head of the Steering Group is still to be determined. However, the basic structure is already in place and phase 2 can be started right away, which basically involves acquisition of the members and contractual setup in the first place.

The whole project structure along with their different parties, their tasks, rights and duties are defined in the iGLAD Consortium Agreement (CA) which lays the foundation for the consortium contracts, both in phase 1 and phase 2. The CA has been developed by using a RASIC matrix, where all roles and their relations in terms of “Responsible, Accountable, Support, Informed, and Consulted” are defined based on a list of all tasks of each role. This RASIC matrix is a tool to ensure that all aspects have been handled and the CA completely covers the rights and duties of each party. Figure 3 shows an excerpt of this RASIC matrix.

Activity	Administrator	Member	Data Provider
Consortium agreement / contractual issues	A	R	I
Controlling of rights and duties	R	I	I
Renewal of Steering Committee leadership	A	R	I
Handle member issues	R	I	I
General procedure	R	I	A
Database maintenance	A	I	R
Data schema changes and updates	I	R	I
Accident cases approval, quality check	A	I	R
Data merging, download	R	I	I
Providing download infrastructure / webpage	R	S	S
Data quality specification and check	R	C	C
Data quality assurance	C	C	R
Data upload	I	I	R
Data recoding / creating a data generator	I	I	R
Data feedback to iGLAD partners (?)	I/A	I	R
Sale of data, money transfer	A	I	R
Regulation of data access	R	I	I
Determine and control data usage conditions	A	R	I

Figure 3 – Excerpt of RASIC matrix for relationships between project roles for phase 2 (2014+).

**Business model**

There have been extensive discussions in the project on how an appropriate financial model that would reflect and balance the interests of all parties for the self-contained phase 2 of the iGLAD project would look like. One initial thought, and also a very simple model for sharing data between loosely coupled research groups, is to just share the data without involving any financial resources. However, reality is a bit more complex and there are partners in the project that only want to provide data or just use the data for analysis. Moreover, there are big differences in the size of the partners. While one data provider has more financial resources and the minimum sample size of 100 cases is an easy task to achieve, other partners reach their limit and are glad to just reach this barrier. Additionally, a big project partner like GIDAS [5] that involves many different organizations also means that more organizations can benefit from the iGLAD data set. This leads to a mismatch between the contribution and the benefit between small and large project partners. The solution is to properly separate each role and its interests and balance all interests on a financial basis. However, this doesn't mean that iGLAD will turn into a profit generating model in phase 2, but strictly remains a project that generates data for non-profit and research purposes.

Finally, when having a closer look at different opportunities and views from different project partners, the task force that should build up a viable business model came to a host of different setup scenarios and interests. The first step was to find out the different roles in the project. It turned out that there are exactly three different roles: Members, Data Providers, and Data Owners (see figure 4). Each party of the project can be assigned one or more of these roles. Even all three roles are possible for a single party. Members are parties that are interested in using the data, Data Providers deliver the data for a specific country to the project and Data Owners have to grant access to the delivered data.

In a second step, relations between the different roles were defined along with the flow of data and financial resources. In order to compensate for the different sizes of projects partners, two options were introduced for the Data Owners. Usually, the owner of the data is compensated with a certain amount of money for providing a sample of his data to the iGLAD project. For big organizations that provide data to the iGLAD project there is also the option to offer a reduced iGLAD membership fee to all organizations that are covered under the umbrella of this specific Data Owner, but each organization has to become a Member of iGLAD to have access to the iGLAD database.

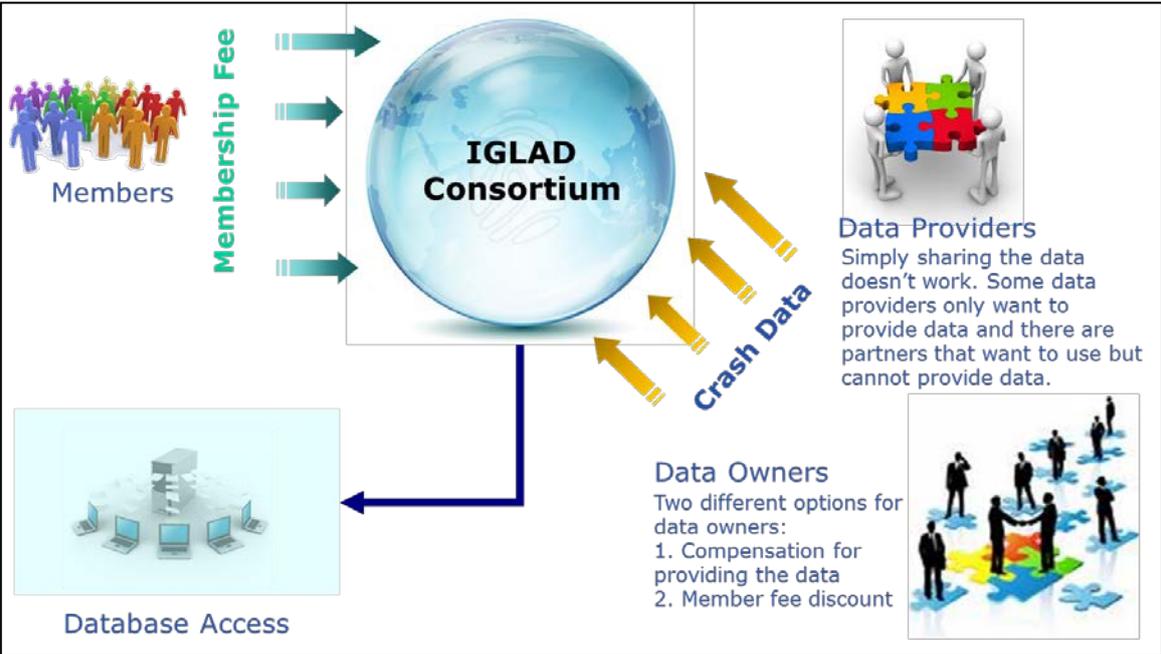


Figure 4 – The business model balances interests in the project for phase 2 (2014+).

As a means to verify that the proposed business model would also work in reality and would lead to a balanced level of funding, a simulation has been conducted based on letters of intent for data providers and potential members. This simulation provided enough confidence for the current model to come into effect.

## **5. SUMMARY, NEXT STEPS, LONG TERM GOALS**

The approach taken by iGLAD is very pragmatic: See what is already there and build on top of it [4]. Also, the results are kept small and simple. iGLAD strives to find an optimum between unifying a limited number of parameters and maintaining realistic targets and effectiveness. To achieve this, the different interests of the supporting parties need to be carefully balanced. Therefore a well suited business model has been developed, to enable the project to continue beyond the starting phase which was funded by ACEA. Also, an appropriate project structure is currently established to organize the different tasks within the project. The result should be a well-balanced data set, where each party provides and receives comparable value. As an additional benefit for the data suppliers, the common data subset might spawn interest for further analyses (or contracted analyses) of their detailed data, i.e. the data available beyond that provided by the common subset.

Nevertheless, despite its target on simplicity, it is important that the data creates a useful basis for typical accident data analysis questions. To accomplish this, the working group needs to prepare relevant use cases of the data for demonstration purposes. After finishing the first data set in mid of 2014, a detailed analysis conducted by different iGLAD members will be started. This hopefully generates enough interest in the data and attracts more members to ensure the continuation of the project. While the next step in the project is to establish the structure for the second project phase, iGLAD's long term goal is to establish a sustainable database of international in-depth data for research purpose and improvement of global road safety.

## **6. REFERENCES**

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