

# **Simulation, Experimentalization and Knowing-how**

An experimental study on real-time documentation and on-site analysis in team sports

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## **ABSTRACT**

It is well-known truism in social simulation research that if the outcomes of a given game can be readily calculated before the game even begins, the game is, using the metaphor of Leifer [8], not worth playing. It is only a game bounded by given rules. In ‘real-life’ team sports, for example, different actors (managers, coaches, players, etc.) execute their strategies simultaneously and the outcomes of the ‘running game’ entail both intended as well as unintended consequences. Various official records, too often, hold information only on allegedly intended consequences. Hence the records are of little help in strategic planning of upcoming action.

The focus of this paper is on how simulation can redirect the learning of experts and enhance their training methods. We use our current project design (case of team sports) as an example to concretize further discussion on the methodology of experimentalization and inquiring social action. We characterize our framework for social simulation based on *real-time documenting and on-site analysis*

developed for the purposes of a specific study. Although we use the term simulation, we actually examine real-time action, the acts and experiences (‘knowing how’) of humans, not mere verbal ‘knowing that’.

## **1. INTRODUCTION**

Considering the popularity of professional sports and the high social prestige of athletes, it is no wonder that many of those who have ever hit a baseball, scored a goal or caught a pass have the dream of becoming a professional athlete.

Not every aspiring – even though talented — young player will have the goal of an opportunity of playing in the professional leagues, and among those who actually make it, few become stars, let alone superstars. Careers in professional sports and especially in the major leagues are by definition individual journeys, and they always involve some degree of social mobility. In countries like Finland, Sweden or Canada none of the other career choices have been as deeply intertwined with

popular myth and personal dreams as hockey. [6, 1, 13, 14, 5, 11] Becoming a professional hockey player requires serious commitment to the sport at a rather early age, not only by youngsters themselves, but also by parents, coaches, managers and even by team-mates. A committed young athlete needs to know the milestones ahead as well as current development in relation to the goals set. Unfortunately young players do not have access to appropriate tools to check how often and efficiently they practice or how their test results and game performances are developing in comparison to their peers. Let alone, if one wants to compare the criteria for gaining play-action in various junior teams.

Professional team sports has been documented and analysed in great volume. However, for some reason, the junior and minor levels are often left wholly without systematic analysis or at best with case by case analysis based on hearsay and traditional opinions. For instance, in Finland there are as many as 70 national sports associations – roughly one for each sport – consisting of more than 9 000 local sports clubs as their members. The State supports sports associations annually with €13 million and €49 million comes from other sources. The six largest team sports (football, ice-hockey, floor bandy, basketball, volleyball and Finnish baseball) make up about 30 % of state grants as well as 30 % of the 3 to 18-year-old athletes and about 50 % of funding from other sources. Each of these organizations, at some point, must have asked how to:

- i) guarantee transparency and fairness of actions for youth/parents, public authorities and other co-operative partners and sponsors.
- ii) how to provide coaching and other support in accordance with each players' needs and abilities.

- iii) how to combine athletically competitive and economically sustainable modes of actions.

- iv) how to promote diffusion of good practices built on facts instead of presumptions.

However, in most sports associations' annual reports it is firmly stated that the common aim is to strive for the above mentioned noble goals (see i-iv). Analytics or strategic simulations providing more exact answers on the questions are extremely rare if not non-existent. In the field of organised team sports the idea of fair play legitimises the belief that access to the highest ranked institution (like the Major Leagues) is granted on the basis of merit, i.e. the recipient's ability and effort. In sports literature the problem of equal opportunity comes up for instance in the discussion of discrimination [see 3,7,9,2].

The general idea of meritocracy, typical to Western democracies, entails the principle of fair play related to the ideology of equity. In the field of education, it transforms into equality of opportunity meaning that 'society' must do whatever it can in order to 'level the playing field' so that all individuals with the appropriate potential can compete for the positions available [12, 4]. In junior hockey 'leveling the playing field' certainly does not mean that the game is open to everyone, for the simple reason that ice hockey is one of the most expensive sports. Most youth from poorer social backgrounds have no chance to take part. Even so hockey associations in all countries give the impression that the fair play ideology and meritocracy are applied to all participants (i.e. more or less middle class kids who can afford to join in.) Considering the great number of parties looking after interests of sports people in deed one would imagine that local, regional and national 'on-site analysis systems' would already be established, however, this is not the case.

Next, we will introduce the main principals of a system for real-time documenting and on-site analysis, which we have developed for purposes of team sports.

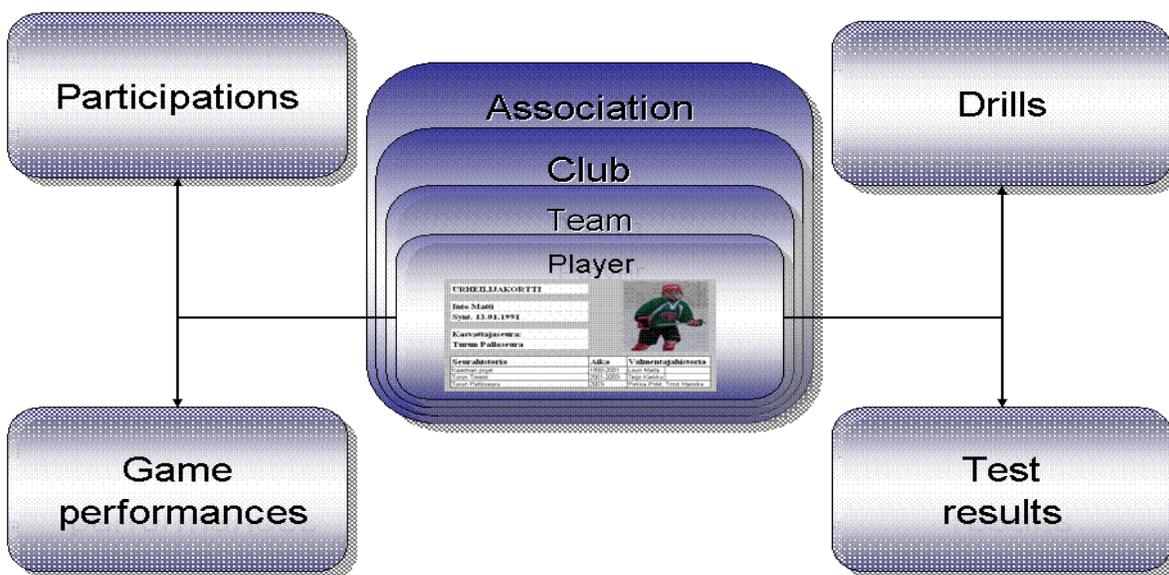
## 2. PLAYER CARD REGISTER

As noted earlier, the documenting practices often are much routine-like, everyday activities. Participations to practices and other events are usually written down somewhere in the coach's own notes. So are the results of various tests. Coaches that plan ahead their training schedules usually have some notes also on the drills

carried out. On a game-day sporting performances are always written down to official records. Our task is to systematize such documenting procedures- practice procedure, test procedure, game procedure – which enables collecting all actions of a young player into his personal digital player card. On the bases of the updated player cards we also develop suitable algorithms to create updated team cards, club cards as well as association cards. Note that this prototype for national player card register immediately makes better use of vast amount documenting activities, which are carried out in any case.



### Building a prototype for real-time documenting in ice hockey



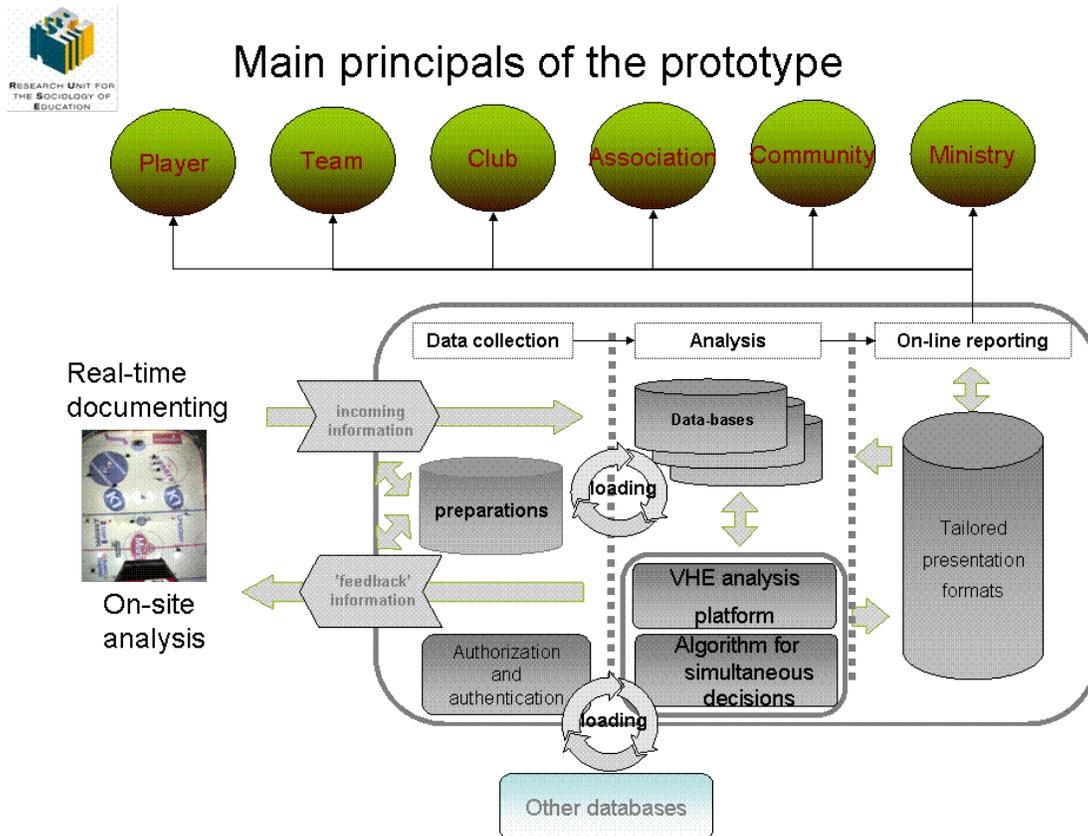
**Figure 1** Main principals of the digital prototype for national player card register

## 3. REAL-TIME AUTHENTICATION AND AUTHORIZATION

When we are dealing with information concerning youth aged 3 to 18 the questions on who is entitled to which information comes into

play. Currently teams and clubs have, on voluntary bases, developed a whole spectrum of personal ways to store delicate information. The starting must be that only the child's official guardian is entitled to read strictly identifiable real-time data. Hence, our prototype must also

entail real-time authentication and authorization systems both in writing data as well as in reading data.



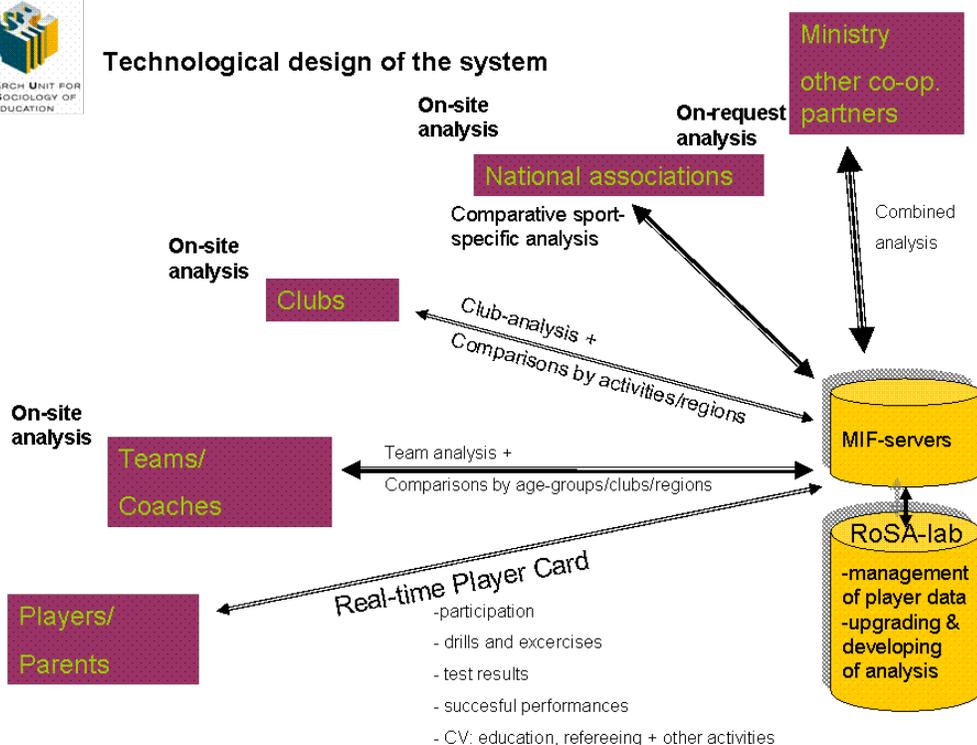
**Figure 2** *Main principals of the prototype for real-time documenting and on-site analysis*

The wireless techniques on one hand provides opportunities to develop real-time documenting and on-site analysis methods in variety of places for instance in outdoor rinks in smaller towns. On the other hand, wireless techniques also pose challenges to authentication and authorizations, which must be kept in mind when testing new documenting methods. The principle of fair play does not allow that the real-time documenting works properly only at largest venues. Note also that on-line reporting also leans on the fact that all relevant data is collected and analyzed in real-time.

Various existing web-service modules and/or larger register-systems cannot stand up to the challenges posed by the real-time documenting and on-site analysis. Therefore, we needed to develop a certain VHE/STR-platform and algorithm for simultaneous decisions, which combined enable, not only real-time documenting and on-site analysis alone, but also constant updating and calibrating of (historical) data from other existing data bases.



### Technological design of the system



**Figure 3** *Technological design of the system*

The core of the technological design of the system is the multi-interface servers (MIF-servers). These servers only can take up the task of guaranteeing that digital data on real-time player cards are in fact accessible in real-time and that all on-site analysis ordered by teams, clubs, associations and other partners are also based on real-time data. In the Research Laboratory of Strategic Action (RoSA-lab) the algorithms and platforms are constantly developed, tested and simulated without causing any disruptions on the functioning of the actual system for real-time documenting and on-site analysis.

### REFERENCES

[1] R. Gruneau, & D. Whitson, **Hockey Night in Canada**, Toronto: Garamond Press, 1993.  
 [2] W. Hurley, D. Lior & S. Tracze, "A proposal to reduce the age discrimination in

Canadian minor hockey," **Canadian public policy**, Vol. 27, No. 1, 2001, pp. 65-75.

[3] J. C. H. Jones & W. D. Walsh, "Salary determination in the National Hockey League: the effects of skills, franchise characteristics, and discrimination", **Industrial and labor relations**, Vol. 41, No. 4, 1988, pp. 592-604.

[4] O. Kivinen, J. Hedman, & P. Kaipainen, "From Elite University to Mass Higher Education. Educational expansion, equality of opportunity and returns to university education", **Acta Sociologica**, Vol. 50, No 3, 2007, pp. 231-247.

[5] O. Kivinen, J. Mesikämnen & T. Metsä-Tokila, **Kylmä kiekkosota – kaksi mannerta, kaksi kulttuuria**. Helsinki: Liikuntatieteellinen Seura, 2000.

[6] R. Lapchick, "Two Ways to Go. Only One

Is a Winner”, In: R. Lapchick (Ed.), **Sport in Society**. Thousand Oaks, Ca.: Sage Publications, 1995, 156-161.

[7] M. Lavoie, “Stacking, performance differentials and salary discrimination in professional ice hockey: a survey of the evidence,” **Sociology of Sport Journal**, Vol. 6, No. 1, 1989, pp.17-35.

[8] E. Leifer, **Actors and Observers: A Theory of Skill in Social Relationships**. New York: Garland, 1991.

[9] N. Longley, “Salary discrimination in National Hockey League: The effects of team location” **Canadian public policy**, Vol. 21, No. 4, 1995, pp. 413-422.

[10] R. McLean & M. Veall, “Performance and salary differentials in the National Hockey League,” **Canadian public policy**, Vol. 18 (4), 1992, pp. 470-475.

[11] M. Robidoux, **Men at play**. Toronto: McGill-Queens university press, 2001.

[12] J. E. Roemer, “Equality of opportunity,” In: K. Arrow, S. Bowles & S. Durlauf, Steven (eds.) **Meritocracy and economic inequality**. Princeton, New Jersey: Princeton University Press, 2000, pp. 17-32.

[13] G. Sage, **Power and ideology in American Sport**. Champaign, Illinois: Human Kinetics Press, 1990.

[14] P. Staudohar, “Salary Caps in Professional Team Sports”, In: C. Jeanrenaud & S. Késenne (Eds.) **Competition Policy in Professional Sports**. Antwerp: Standaard Editions Ltd., 1999, pp. 71-90.

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