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Online System for Management of Sports Activities in India

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Abstract

Sports is one of the most essential aspects of everyday life and with the rise in this arena every time, it demands better outlook, infrastructure and most importantly management. Sports management isn't an outright concept as yet in India with very few dedicated solutions to this agenda. When we talk about sports management we need to discuss the key talking points or the major areas where it can be used, which will define its implementation and will further provide the roles of various sectors. Technology is the greatest tool at our hands right now, the key to every lock, the growth aspect of every nation. Here we want to create a system for the combination of sports management and technology. Schools, colleges have students who wish to perform in various different sporting events at Inter-college level, state level and national level. This is however limited due to lack of information and an organized setup to view, register and then appear at. Everywhere information and awareness are the key but no such online stage has yet been implemented throughout a broader scale. Organization specific sports information is only relevant to that particular college or school in India.

Our sports management system will be a common platform where students can view ongoing and upcoming events, register themselves, and check out statistics. The platform will also be available for its members to avail logistics like gym facilities. Our model will be a step forward making it easy to access and more relevant towards the development of a proper sporting and fitness culture in our country at every level- be it schools, colleges or universities. A web application based management system will be easy to use with its easily understandable interface, common terms and a well maintained administration from the back end. The application will enable features of registration, viewing of new sports tournaments, availing logistics and facilities. Almost the entirety of schools and colleges provide online portals for learning and/ or module delivery. Sports Management System can be implemented by integrating upon these portals and being online or web based it will be accessible to its members on all nooks and corners at every time of the day. It will also provide a ranking system like a leader board comparing each teams and individuals on their performance.

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1. *Introduction*

According to Curt (2005), Sports management is a discipline that uses organizing, planning, budgeting, controlling and evaluating skills in an organization or department that is sports related [7][11]. Our sports management System is an application where students, individuals can register themselves to be available for participation at various sporting events happening across the country at various levels- inter-school, inter-colleges in India. The administration can add up these events on the online platform along with the various required details, for example- age criterion, body mass index eligibility, sports concerned, respective qualification details and overall situational circumstances. We intend to become all systems of sports at the college level under one online platform. This can be very useful for entities as it will reduce paper workload and management loads as we will provide these features [1][6].

Thus, the major problem that stands today in our country is when concerned with sports that it is still considered only a mode of recreation and the key contributor to this thought process is the lack of a well-defined structure and managing layout [6].

The method still followed is the age-old process of manual data collection, pen and paper-based registration for lower levels of sports. This entire process is time-involving, monotonous, and always carries the fear of data loss. This is how an online Sports Management System on development can erase out the aforementioned issues along with generating a wide-scale awareness and interest in sports and its state [4].

The lack of information about sporting events and tournaments is evident today because of the lack of publication of these events. The students in a college or a youth who wants to pursue a career in sports but doesn't have the right information about sporting events and participation in these events. Our model tries to resolve this issue of miscommunication and in some cases no communication at all. Our software tries to reduce that gap in information in this digital age by letting users come online and take part in events and check out stats. This software will be a unified model which takes every aspect of sports from the start of organizing to the end of participation and successful completion of events all in one place [1][2].

The purpose of an online sports management model can be understood with the help of the following points:

1.1 Gathers information about sports tournaments and events occurring at any given time at all affiliated institutions

1.2 Converts old manual, rigorous registration and awareness techniques to one click solutions at hand.

1.3 Helps individuals continue with their sports passion and get themselves challenges at the best levels.

1.4 Creates new opportunities to further enhance the sporting culture at our schools and colleges.

1.5 Implements wide-scale awareness and knowledge [4].

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Sport is one of those extra-curricular activities that most of the students like to participate in, whether it is at the school, state or district level. Different students will be interestedin a variety of sports. But sometimes the students may not be able to participate in such games since their names will not be in the participants list. This will happen only if the names are taken through the pen-paper based method. To solve these problems, the sports management model can play a very good role. The students will be able to register their names in different sports of their choice at the college level or state level through this application.[12]

2. Related Model

The method still followed in India is the age-old process of manual data collection, pen and paper-based registration. This entire process is time-involving, monotonous, and always carries the fear of data loss [14]. This is how an online Sports Management System on development can erase out the aforementioned issues along with generating a wide-scale awareness and interest in sports and its state. We often find institutions and their respective officials hassling around college authority with the big stacks and bundles of paper load. This is not only a humongous task to carry out but also more prone to mistakes. One can always sheepishly miss a small piece of paper from the big stacks. This can create loss of data from a miniature worth to an invaluable one. The existing system asks students to look out for tournaments and facilities themselves in remote areas or where sports hasn't reached the institution level yet [2]. Also, in the present system the organization of sports is done by manually booking venues by visiting them. Since most of them host one event or the other at any given time or season, it increases the activity of moving to every nook and corner of the city in search of an available indoor or outdoor venue [1].

Sriboon (2007) says that people of Thailand use sports to develop social and emotional abilities and physical and mental strength as well. The discipline is taught starting at school and is managed for each individual throughout their sporting career [9]. According to Ting (2007), the lawmakers of Taiwan came to the conclusion that there is a need to apply managerial concepts to public sporting facilities to manage them. Thus, Taiwan Society for Sports Management (TASSM) was formed in 2000 to manage sporting integrations [8].
In Malaysia, sports management are done by government policies. There are policies that help the growth of sporting personalities in every level of sports. This kind of system is not placed in India. There is no specific sporting management structure that works for every level of sports [7][13].

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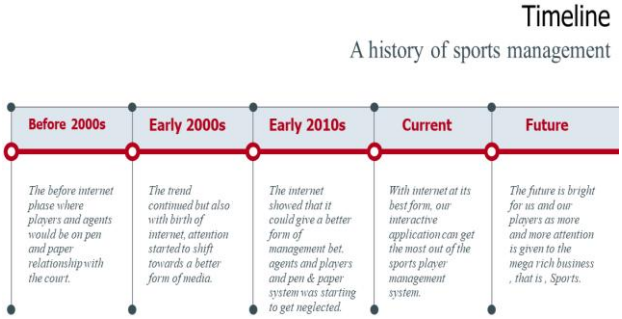
Previous Model	*Our Model*
This model is based upon outdated pen & paper model of management.	Our model is an interactive application based on web and is a fast method of management.
This model has a lot of complications as depends a lot on manual information and data which has a danger of getting lost or written flawed.	Our model, being based on web, has a backend database which can store information about all the players and their data, contracts, meetings and etc. These features make our model better.
This model doesn't provide all time access as online model does.	Our model provides 24x7 access of our players through our website. This makes it easy for our clients to understand their contracts and profile better.
This model doesn't have the security strength that our model has.	Online model provides better security to your contracts and your profile with the help of backend security technologies.

The Existing system in our country thus depends entirely on manual entry based on pen and paper mode. The advent of technology requires Sports to be managed and organized in a way where technology can play a major role and thus shape the growth of technology, automation and management in the Sporting industry.



Sport inspires, excites and brings in the much-needed front of passion and recreation combined together. The variety of sports offered on the portal opens a plethora of options for the students and physical educators. But sometimes discrepancies occur which create a fuss and make silly errors such as missing names or mistaken identities. This happens when the names are taken through the pen paper mode. In solving these problems, the sports management system can play a major role. The students will be able to apply their names in different sports of their choice at the college level or state level through this application. [1][2]

2.1 The role of management in sports:

Management of any event, attribute or aspect deals with an organized and structured layout of how the hierarchy should be maintained, how information has to flow in the system, and what all needs to be taken care of. Sports too require a similar approach and implementation technique. This is where the Sports Management System comes to the fore and creates the overall outlook of the system. [4]

2.2 College and school students:

Sports awareness is present at its pinnacle among the youth. Students can cater to their desires of achieving high standards in sports with the help of a common platform to understand, register and participate in various events and tournaments throughout the timeline for which they are registered. [2]

2.3 Online availability:

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The website and online implementation of the management system will be a foremost in sports where the manual obsolete and rigorous system is gradually falling out of favour. The data storage, easy accessibility and easy data retention enable better management on the administrative level and also establish trust among the participating individuals. [4]

2.4 Ranking System:

The ranking system will be a representation of a leader board which would show the performances of eachindividual and teams in a particular event. This type of data can be used by teams and individuals to assess their performance and level. Using machine learning, we will make a model which learns from our dataset and ranks their performances.[4]

3. Proposed Model and Methodology

The proposed mode of this project is to answer the problem statement mentioned before by creating an online website where students from all institutions can register and view various events where they can participate. It will be easy and laid out along with secure data storage on a permanent timeline basis.

Our model will benefit individuals to gain more access to tournaments and get exposed to the real deal at a timeline quicker than the old pen-paper mode. Providing one platform for all sporting needs serves the entirety of purposes for our users.

During registration each individual will have to enter his or her present institution credentials, and will only be allowed registration when the eligibility is met. After meeting the aforementioned formalities and getting himself or herself registered with an account, the individual can select from any of the options that will be available on the website- tournament selection for respective sports, logistics, gym facilities. There have been older registration processes however all manual. We will be showing here the online system which will be more handful, easy to use and relative to the individuals. A website will be available to its users at all possible times. It is scalable, more reliable and better managed.

3.1 System Architecture Design:

The architecture of our model will be of four layers. They will define our model's implementation and approach. The four layers of the model are as follows:

3.1.1 Base layer

The base layer comprises the general system structure and software-hardware interaction. Server operating system, storage components etc. constitute this layer.

3.1.2 Data Layer

Data is the most essential part of any online facility or provision. The data layer holds the database storing the essential files, folders and backup of both client and company.

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3.1.3 Application Layer

The application layer provides the communication bridge between user operations and background database. The key function modules include load balancing, data analysis, data management, data backup, portal integration, other web services, and so on.

3.1.4 Interactive Layer

The interactive layer enables institutions to view the tournaments, student profiles, access desired facilities page and view how their purpose shall be served. It deals with database and website connectivity and how
it can be aggregated overall.

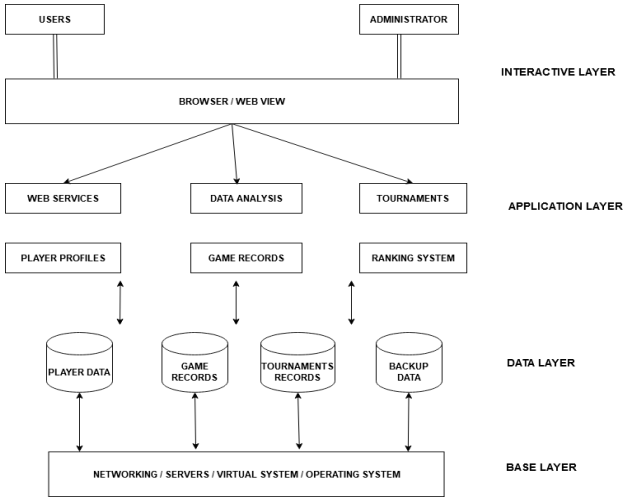

Fig 1. System Architecture Diagram

3.2 Modules:

The model contains three types of modules that will interact with the system. The modules are defined as follows:

- **Users Module**: This consists of players, coaches and other staff (such as medics, physios).
- **Admin Module**: This looks over everything happening in the system. Its objective is to provide all the necessary details to the user and the coordinator. It gives username and password to users and checks if all necessary resources are running correctly or not. It maintains the system as it is.
- **Coordinators Module**: This is the module which looks over every aspect of the service and provides services as promised. It helps organize tournaments, provides logistics facilities.

3.3 DFD Diagram:

A data-flow diagram is a way of representing a flow of data through the management system model. The DFD also gives data about the input and output of each entity and also the process.

The following shows how and where the information flows in the Sports Management System.

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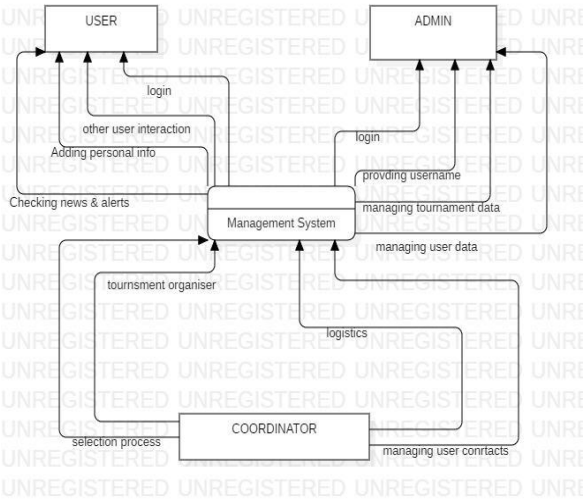

Fig 2. DFD diagram for Sports Management System.

3.4 E-R Diagram:

The Entity-Relationship diagram establishes the various entities of the Sports Management System and how the
different entities along with their attributes are related to one another.

- Administrator: The one tasked with data storage, manipulation and backend processing
- Players: Individuals registered to avail the various facilities
- Coaches: Faculty responsible with the institution level implementation and carrying out.

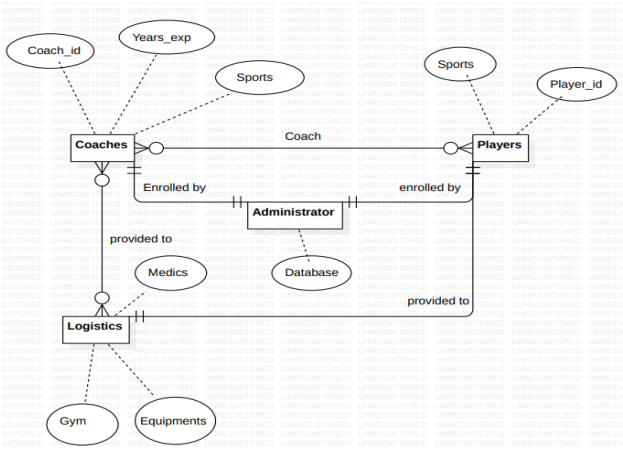

Fig 3. E-R diagram for Sports Management System

4. Implementation Design

This model will be a web app that can be accessed by users through their computer and mobile. The application will use frameworks and technologies to give better security and create response content dynamically.

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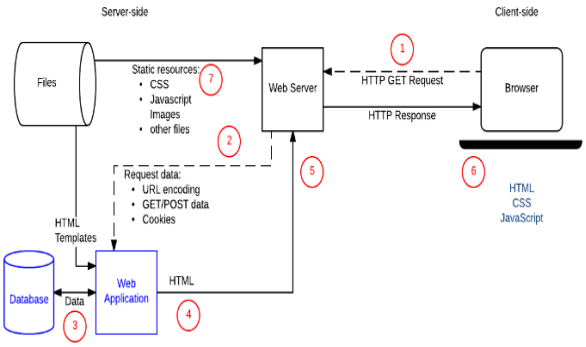

Fig. Interaction of server and client-side frameworks of the application.

The Fig. explains the architecture of the dynamic application where browsers send HTTP requests to the server and the server processes the request and sends back the HTTP responses. The dynamic approach of the software is very important as it provides the efficient storage of data and proper delivery of information with controlled access to content thus providing customized user experience. The system architecture approach refines the responses based on data analysis.

Using Nodejs as a backend runtime environment, dependencies are supported which contain binaries, shared libraries or JavaScript modules. The fig. below previews the dependencies in the application.

```
dependencies": {
 "body-parser": "^1.19.0",
 "connect-flash": "^0.1.1",
 "ejs": "^3.1.2",
 "express": "^4.17.1",
 "express-session": "^1.17.1",
 "method-override": "^3.0.0",
 "mongoose": "^5.9.10",
 "passport": "^0.4.1",
 "passport-local": "^1.0.0",
 "passport-local-mongoose": "^6.0.1"
```

HTTP requests coming from the client side are sent to storage to unit to access data. Thus for storing data we will use the MongoDB database. The code snippet previews the database connectivity to the Nodejs application.

```
//configs
mongoose.connect("mongodb://localhost:27017/smsNew", {
  useNewUrlParser: true,
  useUnifiedTopology: true,
});
```

To access the data, a Data Access Object (DOA) layer is created where the function which is directly connected to the database fetches data and saves data from and to the database.

The key challenge in data modelling is balancing the needs of the application, the performance characteristics of the database engine, and the data retrieval patterns. When designing data models, always consider the application usage of the data (i.e. queries, updates, and processing of

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the data) as well as the inherent structure of the data itself. Our application's database takes into account these factors. The user queries and updates from the game records are handled properly with inherent model schemas. Model schemas are structures which are stored in databases and mongoDB collections help us to store documents of data without having the same schema which means different forms of data or information can be stored at a single place. These features help as the documents in a single collection do not need to have the same set of fields and the data type for a field can differ across documents within a collection. Our application stores data in embedded documents form. Embedded documents capture relationships between data by storing related data in a single document structure. MongoDB documents make it possible to embed document structures in a field or array within a document. These *denormalized* data models allow applications to retrieve and manipulate related data in a single database operation.

5. Conclusion

Sports play an important role in the lives of Indian people. Sports can be a source of income or can improve the quality of life of the Sports person (Myers 1999) [10]. In India, the major problem that stands today when concerned with sports is that it is still considered only a mode of recreation and the key contributor to this thought process is the lack of a well-defined structure and managing layout [15].

The method still followed is the age-old process of manual data collection, pen and paper-based registration. This entire process is time-involving, monotonous, and always carries the fear of data loss. This is how an online Sports Management System on development can erase out the aforementioned issues along with generating a wide-scale awareness and interest in sports and its state.

These issues will be eradicated by the implementation of a full-fledged online platform for sports events, tournaments, management and facilities.

With Sports Management and organization proper use of technology can be used to implement a systematic structure for talented players from schools, colleges or individual representation to access and view ongoing tournaments, avail sporting goods and facilities and have a proper approach to their sporting career. This emphasizes the growth of a culture and tradition of taking sports not just as a hobby but as a passion and pursuing it as a proper profession.

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