The College Data Asset Management and Strategies of the Data Asset Utilization

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Abstract

This paper mainly discusses the methodology of data governance and data management. With the continuous promotion and increasing use of Smart Campus in Chinese colleges, and the establishment of several information management systems with different functions, all the systems and technologies, as whole, have been produced huge amounts of data and is not going to stop in the future. However, most of those colleges have not built up executable and highly efficient methods in terms of data utilization and data mining. Therefore, this paper aims to introduce the concept of data asset into data management, which takes advantages of attributes and characteristics of Asset and also combines with the current development stage of each school. Then, evaluate the importance of massive and multi-dimensional data, so as to determine the value of data and form a mature and effective data governance model. Meanwhile, the paper puts forward some suggestions on the use of data after the establishment of data asset management. On the premise of ensuring the data security of colleges, the data asset management system is utilized to support the school management decision-making in terms of student development, human resources, and research studying in order to offer the manager of college appropriate method for data management and utilization strategies.

Keywords

Data Governance, Data Asset, College Data Security.

1. Background

Currently, many colleges have strong and complete information management system, which basically covers the main workflows of the school and fulfills the daily operations. Thus, the data that generated from those systems is supposed to be able to meet the requirement of data range and support the decision-making of the college management optimistically. Partially, the data works orderly, relatedly, and the logic is clear and straight. But if observe the data from the perspective of the overall operation of the college, it is out of order, independent, and complex due to the multi-version generators and data standards. The importance of the data between each system is not defined clearly. Managers do know what data sets should be on the table when they make decisions, but when they go through the data provided from several departments, since the data set comes from multiple sources and standards, the global analysis and judgment could be achieved hardly and slowly. Therefore, it is necessary to solve the problems of large amount of data repetition, data invalidity, and the storage of useless data before processing the data. For example, the personnel department has a set of independent personnel management system, and so the financial department does, which is a set of independent salary management system. Those 2 systems do not carry out data importance analysis. Whenever the personnel department needs to count and evaluate the annual scientific research achievements for each teacher, the financial department transfers the expenditure of whole year research without

importance analysis. The personnel department works in poor efficiency because of the shortage of accounting background. Due to the disconnection of different data, it easily leads the data statistical direction to the deviation.

Although, it seems the management system works well in every corner, if viewing the entire school workflows in general, the situation is not optimistic. Each department has not carried out a universal data standard to evaluate the importance of the data within different environments and contexts. The more data is generated, the more chaotic the decision circumstance becomes.

Moreover, the college management team does not give a high priority to the data governance and not truly realize data is no longer a simple inventory but a significant asset for each organization. A large part of the data is valuable and silent, because there is no importance analysis. These data can be the solid foundation of data mining and data analysis, so that it provides many suggestions in terms of teaching management, policy development, and so on.

Therefore, the method of addressing problems of disconnection and irrelevance is urgently needed. The establishment of data evaluation system is the milestone that each college in China to transform into the Smart Campus. Thus, the concept of Data Asset is brought to the field of data management, which helps the college enhance and extend the capability of data utilization effectively.

2. Data Asset

2.1 The Concept of Data Asset.

The word data "data asset" was mentioned by Richard E. Peters in 1974. In 2018, Zhu Yangyong, Ye Yazhen defined data asset as data set with ownership, value, can be measurable and readable in cyberspace. Data is also a set of meaningful resource which clustered together to great scale. In some context, group data is utilized to capture the behavior of the organization, and in the other context, single pair of data also can be the foundation resource to build the management model. Data asset as one of the model principal factors of production is sharing the same role of energy and materials. What behinds the data asset is the wealth in term of society, it represents the unstructured information, the element of final conclusion, and the guideline of management. Thus, data is a valuable intangible asset, which requires to be estimated and stored carefully by the organization, just like the other valuable asset. Manage the data in assets way--note down the record and check regularly, have the confirmation that there are relevant persons in charge of the data.

2.2 The Attributes of Data Asset.

The asset refers to the resource, which formed by past transactions or events, owned and controlled by enterprises, is expected to bring economic benefits to the organization. According to the attribute of assets, the attributes of the data asset is described as the subset of the attributes of assets. Meanwhile, data asset also obeys the law of data itself. So that the data asset follows dual dimensions, one is the concept of the asset and one is the data itself. In the term of the goal of assets, benefiting the organization comes first.

If follow this principle, the structure of the asset side is clear. It contains the generator, the owner, the user in term of roles, which matches the exploration right, ownership, and use right. All these 3 roles are separable and coexistent at the same time. It also has attributes of value, liquidity, potential output, timeliness, and scale. Data asset is valuable resource as mentioned before, but it also needs to be transferred and processed. Same as economic assets, the output is not able to make sure it could meet the expectation 100%. Moreover, value of data becomes higher as the timeline from the left to the right. The large scale improves the possibility of data analysis output.

For data itself, it follows the principle of the local data management firstly. Then, the importance, the security requirement and security level, the term of validity, the group data, the individual data, and the outlier are taken into consideration, which enrich the entire the rating system of data asset.

But as whole, there are 5 main field of factors impact the importance of data mainly. Social economy decides whether the data is asset or not. Or, it might bring potential valuable information back. The

data that impacts the policy directly and significantly occupies more room in the importance. Like how search engine works, the more data usage frequency is, the more important it is. The status of data generator shares the same logic, data from higher manager takes higher stage in term of the data value. In the time of big data, data scale dominates the value of database, the bigger database is, the closer it approaches the reality.
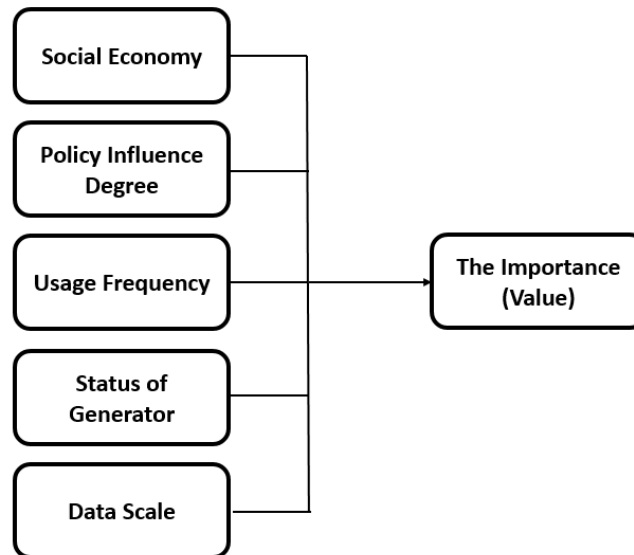

Fig. 1 the Main Influence Factors for Data Asset

3. The Influence Factors of Data Importance

According to Table 1, it lists the influence factors from 5 perspectives and none of them are capable to impact the rating system individually. Therefore, the influence is imposed jointly. However, all factors do not have the same weight to decide which kind of data more important. So, besides the influence factors, the weight of each influence factor need to be weighed. Actually, the influential range of factor is different in different context and cases. Because of the limitation of impact measurement and studying materials, only the college data asset takes into consideration.

Social Economy

The social economy effects is one of the core foundations and purposes of college running. Accordingly, the data with social economy effects should be placed at the core of these 5 aspects, thus, the destination of all data is supposed to serve it. Only in this way can data assets better serve college management. Taking the social economy effects of data as the guideline, then decompose the data according to different objects and issues. The data that can produce social economy effect is the data asset with high value.

Policy Influence

Some data can impact on the college policy directly, somehow it provides data basis for management and supports the decision-making, so such kind of data is generally called descriptive data, which plays an important guiding role in description of daily management. It reflects the work results every day, month, semester, and year systematically and comprehensively. Therefore, the more influential the data is, the higher the value is.

Usage Frequency

Similar to the policy influence, usage frequency works in the logic method of the search engine and the cited ratio of academic papers. The more frequency data is quoted, the more scenarios and roles data is applied, and the more valuable it will be. The data under this standard needs to be well preserved and maintained, it also need to provide the confirmation of integrity and accuracy regularly and officially.

Status of Generator

Obviously, higher positions and departments generate data that more important than the lower positions and departments. The importance of data is different as the status is different, the value of single data declines from top to bottom. Although such data may not have very economic effect sometimes, it still requires strong security protection systems. Because it usually involves the privacy and confidentiality within the college management, such as personnel information.

Data Scale

In the context of the development of big data, the scale of data is becoming indispensable for the growth of organizations. It is the bricks that can build the tower of big data analysis. Data with depth and breadth is an increasingly essential asset in this society. Particularly, the scale effect is obvious in the application of big data analysis. Data model, which injected by massive multi-dimensional data, can improve data governance ability continually, so that it eventually works for evaluating both advantages and disadvantages of daily teaching management and the development trend of college.

4. Strategies of the Data Asset Utilization

For colleges, the manager usually pays attention to the teaching conditions and education environment, also ensures teachers can work together to complete the teaching segment smoothly and coherently. The standard of weighing should take it as background. The data is separated into 2 parts, one is descriptive data and the other is predictive data. The former is the data that offers the description of objects or events during daily management, for example, the average research outcomes of each professor is 3 papers this year, which describes the research quantity of college this year. And the latter is the data that collects current data set and build up the data model in order to predict what is going to happen after managers adopt certain management methods. Also, it predicts the trend of development. The conclusion formed by multiple data is classified into this category for models establishment.

Description Model Application

Therefore, there are 2 types of model can be established. The first one takes the advantage of managing data to describe colleges operations, such as regular college operation report, monthly teaching report, and annual operation report. Through following the tracks of key data, it calculates the average value and then establish the regression equation. When the abnormal value occurs, the college can find it in time and locate the head of problem.

Prediction Model Application

The prediction model is for the analysis and prediction, which supported by the technology of big data. Based on the basic data accumulated over years, the data warehouse is established according to different objects to predict the development trend and student source trend of the college.

Both of models are not perfect, especially in new-born stage, they need to be corrected and updated constantly. When there are real data that do not conform to the model, two situations are taken into consideration, one is, as mentioned before, model problems. The other is that the abnormal values are caused by some unexpected reasons beyond the border of the model. At this time, abnormal events can be found and investigated, it helps to generate the knowledge base to solidify the model and knowledge management.

5. Conclusion

Big data technology is becoming more and more indispensable for college management and teaching, so data management has been put on the administrative agenda of many colleges. Currently, the plan is usually to cooperate with IT companies in establishing information platform and control data simply through technology. However, due to the shortage of bottom design, the effective governance strategy was not established where the data platform started. Thus, the introduction of the concept of data assets helps school managers have the insight into the essence of data management, which is data is an asset that improve the quality of management and teaching with a little capital investment.

Data asset has scale effect, some part are "expensive" and the other may be "cheap". The "expensive" needs high security level, reliable backup mechanism, and is supposed to be used carefully. Only in this way, can colleges draw a clear and logical blueprint of data management in the era of big data.

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