In-Memory Business Intelligence for Study Program Accreditation in Indonesia

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Abstract: The purpose of this research is to create a BI dashboard which is appropriate for the study program in presenting quantitative data of accreditation. The method used in this research is the Agile BI method. This research is focused on the design of Human Resources in the study program. The result of this research is an in-memory BI dashboard which can be used to facilitate study program in doing quantitative data explanation during a visitation of the accreditation.

1 INTRODUCTION

In Indonesia, accreditation study program activities are routine and mandatory. This obligation is followed by the preparation of the accreditation documents that follow the standard of Indonesia Accreditation Organization (BAN-PT) which leads to the presentation of documents when visitation from BAN-PT.

In facts, during the visitation lots information must be explain but time that given is short. Thus need information summarize for time efficient to support BAN-PT assessors in making decision.

Business Intelligence is a concept and method for improving the quality of decisions based on data. BI equal to briefing books, reports and query tools, so using BI organizations could take advantages in making decisions effectively and efficiently.(Ştefan Maria Dan Academy Of Economic Studies, 2009) (Visinescu, Jones and Sidorova, 2017).

For those reason, BI can be the basis for summarizing information needs of the accreditation study program.

2 RELATED WORKS

Business Intelligence directly or indirectly influences the quality of managerial decision making (Wieder and Ossimitz, 2015). Business Intelligence enables organizations to make well informed business decisions and thus can be the source of competitive advantages. The ultimate objective of business intelligence is to improve the timeliness and quality of information (Babu, 2012). Even though, implementation of Business Intelligent in study program is rare. Some recent study about implementation of BI in academic field is BI dashboard for academic library and personalized student (Zucca, 2013) (Sluijter and Otten, 2017).

One of the most things to do in study program is accreditation. The Accreditation is a comprehensive evaluation and assessment process of the commitment of the study program to the quality and capacity of implementing education, research and community service called Tridarma Program in Higher Education, in order to determine the feasibility of the study program to organize academic program.

There are some recent research about accreditation system (Saputro, Anggraeni and Mukhlason, 2012) (Nofriadiman, 2017). Those focus in study program self-evaluation and data archiving system. The system deployed to know study program self-evaluation in certain time through dashboard. Others focus in data preparation so accreditation team in study program could find data needs in one place.

Because accreditation is so important in Indonesia higher education thus the advantages of information communication technology must be used to support the implementation. This research

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needs to do in order to support accreditation implementation especially during the visitation. We are focused on the design of human resources in the study program. Develop an In-memory BI system to get dashboard that supports BAN-PT assessors in making decision.

3 METHOD

This study uses the BI Agile method which consists of 5 stages. They are concept, inception, construction iteration, transition, and production. Figure 1 shows a method cycle.

In the stage of Conception development goal determined after that business requirements identification define. Based on that requirements BI prototype made so on until meet the needs of business requirements, its activity in construction iteration. The two last stages are testing and report.
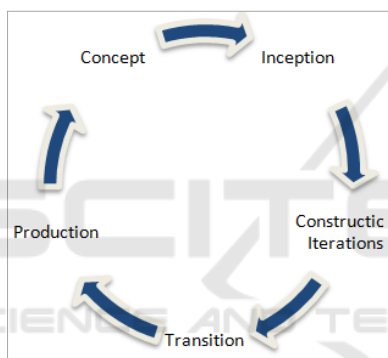

Figure 1: Agile BI method.

4 RESULTS AND DISCUSSION

4.1 Concept

This stage is the initial stage where the research objectives are established. The design of In-Memory BI for program study accreditation is made based on BAN-PT document reporting standards. At this stage, two things were determined that are information needs analysis and dashboard design for human resource component.

4.2 Inception Phase

Business needs for the BI system accreditation of study programs refers to BAN-PT accreditation forms. The data needed to get information needs

based on my human resource standards are as follows:

- Permanent lecturers whose fields of expertise are in accordance with the field of study programs
- Permanent lecturers whose fields of expertise are outside the study program
- Presentation of lecturer education
- Presentation of lecturer academic position
- Lecturers expertise that linear with study program
- Lecturers expertise that not linear with study program
- Lecturers education
- Lecturers functional position
- Teaching activity of linear lecturers
- Teaching activity of nonlinear lecturers
- Adjunct lecturers
- Teaching activity of Adjunct lecturers
- Expert speaker from other university
- Lecturer on study duty
- Lecturer conference/workshop/training activity
- Lecturers achievement in education, research, and community service
- Membership of lecturers in professional organization
- Study program staff

4.3 Construction Iterations

This stage is the development stage of the BI system prototype for accreditation of study programs. There are six steps taken at this stage as shown in the Figure 2.
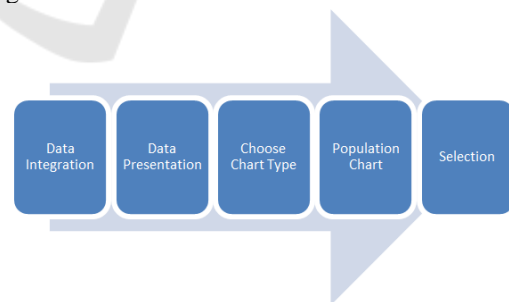

Figure 2: Stages of BI in-memory development.

The first step is data integration. At this stage the selection of data to be visualized is carried out. The data used is the data of the study program lecturers in the form of * .xls files. Furthermore, a data review is conducted to ensure the suitability of the column name and contents, this stage is called data presentation. After that, choose a chart type that is

suitable for data representation. And then select a dimension for grouping data calculations and determining expressions for calculating values on the chart. The last step is add field to make data connection selection with chart.

4.4 Production

The following is the design of a dashboard for information requirements according to standard 4 human resources. The information's generated are:

- Presentation of linear expertise lecturers
- Presentation of lecturers' education
- Presentation of lecturers teaching activities
- Presentation of lecturers' scientific publication

- Presentation of lecturer achievement in education, research, and services community
- Presentation of lecturer scientific organization

Figure 3 shown lecturer dashboard cover information requirements that analysed before divided into functional position, academic title, lecturers' achievement, lecturers expertise, lecturers teaching activity, lecturer scientific organization. The selection divided into

In Figure 4 the dashboard shown zoom in of the chart selection. The dashboard show zoom in lecturer achievement activities.
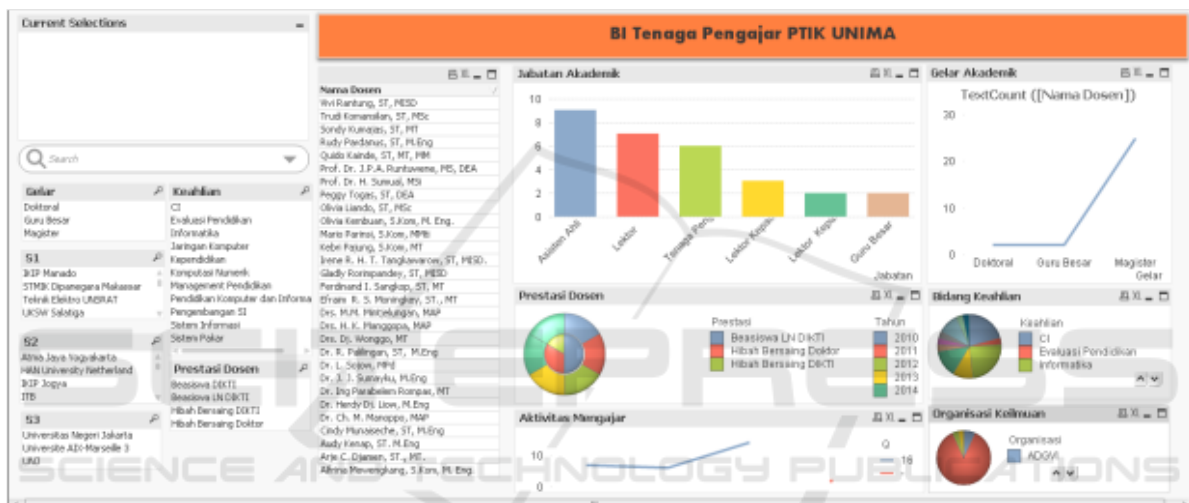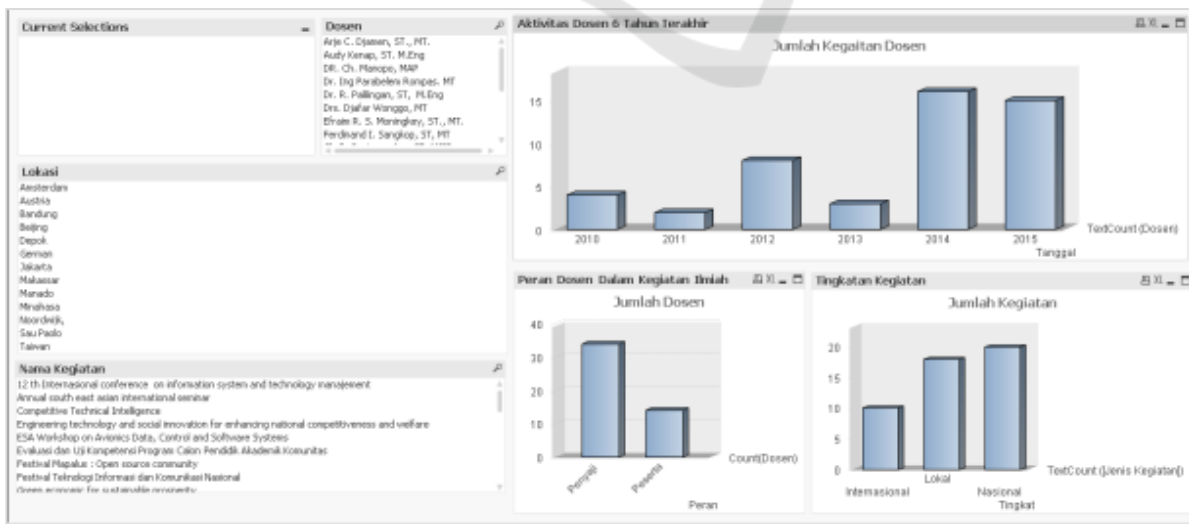

Figure 3: Lecturer dashboard.

Figure 4: Lecturur activity dashboard.

5 CONCLUSION

Using the Agile BI method can be developed BI solution based on the business requirements. Utilizing the In-Memory BI application (QlickView) can reduce the complexity level of BI development, beside that it's easy manage, easy modify, and fast access information needed by BAN-PT assessors, but the dashboard have a function to supporting user in making decision not giving a decision. Thus, a good preparation of data sources needs to consider, also security mechanism in data level to present up-to-date and relevant information. (Rantung et al., 2018)

REFERENCES

Babu, K. V. S. . J. 2012 'Business Intelligence: Concepts, Components, Techniques and Benefits', *SSRN Electronic Journal*. pp 60-70

Nofriadiman, V. W. 2017 'Perancangan sistem informasi akreditasi program studi sekolah', *JOISIE Journal Of Information System And Informatics Engineering*, Vol 1(2), pp. 95–102.

Rantung, V. P., Kembuan, O., Rompas, P.T.D., Mewengkang, A., Liando, O. E. S., 2018 'In-Memory Business Intelligence: Concepts and Performance', in *IOP Conference Series: Materials Science and Engineering*. Vol 306 (2018), pp 1-5

Saputro, F. C., Anggraeni, W., Mukhlason, A. (2012) 'Pembuatan Dashboard Berbasis Web Sebagai Sarana Evaluasi Diri Berkala Untuk Persiapan Penilaian Akreditasi Berdasarkan Standar Badan Akreditasi Nasional Perguruan Tinggi', *Jurnal Teknik ITS*, Vol 1(1), pp. A397–A402.

Sluijter, J. , Otten, M. 2017 'Business intelligence (BI) for personalized student dashboards', in *Proceedings of the Seventh International Learning Analytics & Knowledge Conference on - LAK '17*, pp. 562–563.

Ştefan Maria., 2009 'IMPROVING THE QUALITY OF THE DECISION MAKING BY USING BUSINESS INTELLIGENCE SOLUTIONS', *Annals of the University of Oradea Economic Science Series*, Vol 18(4), pp. 996–1000.

Visinescu, L. L., Jones, M. C, Sidorova, A. 2017 'Improving decision quality: The role of business intelligence', *Journal of Computer Information Systems*, Vol 57(1), pp. 58–66.

Wieder, B. and Ossimitz, M.-L. 2015 'The Impact of Business Intelligence on the Quality of Decision Making - A Mediation Model', in *Procedia Computer Science*, pp. 1163–1171.

Zucca, J. 2013 'Business intelligence infrastructure for academic libraries', *Evidence Based Library and Information Practice*, Vol 8(2), pp. 172–182.