**Caterpillar Tunneling Case Study – Analysis and Proposals**

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**Introduction:**

Caterpillar Inc. – a fortune 100 company – is an American corporation that designs, develops, engineers, manufactures, markets and sells machinery, engines, financial products and insurance to customers via a worldwide dealer network. It is the world's largest construction equipment manufacturer.

Back in 2008, the Caterpillar announced its entry into the tunnel boring business through the acquisition of Lovat Inc. – headquartered in Toronto, Canada - and later renamed it as Caterpillar Tunneling Canada Corporation (CTCC) and made it a part of its division called Caterpillar Diversified Products Division.

Lovat was founded in 1972 and used to specialize in custom design, manufacture, and services of Tunnel Boring Machines (TBMs. It had an employee strength of 330 people and sales agents located in worldwide locations. It had several high-profile contracts esp. in Canada and Australia. It was a family business and lacked any standard organizational governance, project management, and decision processes. After the acquisition and renaming of Lovat to CTCC, there was a need to integrate CTCC with the parent company, but unlike the parent company where processes were highly methodical, procedural, and **repetitive**, CTCC’s model, to a great extent, was project/contract based. As a result all the established manufacturing protocols couldn’t be directly applied at CTCC.

**Context:**

Project management at CTCC was lax and lacked consistency and regular status reporting. Because of this, often the projects ended up significantly over-budget. To overcome these issues, an external consultant was hired to assess the project management processes and consulting and required training, planning and control. CTCC also got a web-based update system. All of these measures resulted into a significant improvement in terms of project delivery and team communication.

An ERP system was also there and it had all the required modules for project management, and reporting for various departments such as sales, finance, purchase, administration etc. but it still suffered from major deficiencies:

1. Unpredictable behavior, because of heavy customization, which led to major dissatisfaction among the users.
2. Many of the departments used to have their own silo applications to support those processes that the ERP couldn’t handle.

After the acquisition, Caterpillar embarked upon the exercise of implementing enterprise-wide SAP ERP-platform and CTCC was the first one to be chosen. After working on this for over a year, it was realized that the project was going significantly over-budget in terms of resources like funds and human resources and also CTCC’s project based business model was unique and required a SAP template to be designed from scratch. As a result, this project was put on hold indefinitely and hence the only fallback option was the existing ERP solution.

Owing to all of the above reasons, the Business Intelligence system of the company was facing many problems such as data inconsistency, uneven reporting, and poorly defined processes. After the cancellation of the SAP integration exercise, the existing BI system became even more critical. Although the BI system allowed the users to link to disparate data sources, the bigger problem were as follows:

1. Not all business units were ready to adopt the software
2. Even if a few departments were ready to adopt, there were different types of users in the respective departments:
   1. Tech savvy - who were ready to adopt and use the software
   2. Others - who were passive users and preferred to rely on traditional channels of information gathering.

Owing to this great divide, the BI platform was not being used to its full-potential and it had become imperative for McEwan, the Business resource manager, to find a solution so that the BI platform could be adopted and used by all the relevant users, and thus helping the organization in achieving its long term goals towards better profitability.

**Analysis:**

**Challenges being faced:**

As described in the previous section, the company is facing the problem of lack of an efficient and required Business Analytics system that would help the senior management in taking the right decisions in time.

Some of the departments were able to overcome most of the challenges that they were facing, with the help of ERP department.

But a few departments are still grappling with the BI specific challenges. These departments are as follows:

**Project Management Office (PMO):**

* Most of the PMO members were not ready to adopt the system for reasons such as lack of time or they didn’t understand the benefits of it.
* Finance department stored payment data into a separate software system and not in ERP it was not visible to the PMO, unless asked for, and hence the PMO had no visibility of profit margins for different parts of a machine.

**Engineering:**

* A wide user adoption was missing here too.

**Finance**:

* There is duplication of data between finance and other departments.
* There are different versions of report being produced by different departments for the same function e.g. labor. All of this is leading to not only different sources of truth, but also to misrepresentation of data.

Apart from the departments specific challenges, all of the departments are facing the following challenges:

* Since it has not been mandated by the senior management to adopt the BI tools, the potential end-users decide about the adoption according to their whims and fancies.
* Lack of optimum communication among different departments.
* Since there is a lack of wide user adoption, the ERP department doesn’t get optimum feedback so as to improvise existing features or add more features that may be helpful
* Lack of participation in training programs
* Since reports on BI was developed on the basis of specific requests, each report had very specific purpose and at times only the requestor and designer used to comprehend the report.
* Overtime, large no. of such reports were developed and different departments showed overlapping features.
* Since there was no direction from single authority on the overall development of enterprise reporting, development continued to diverge to meet each requestor’s demands.
* No one had taken the steps to review all reports collectively to determine the conflicts if any.
* Some found it an effective tool for decision making, but others found it confusing and stopped using it altogether.

**Challenges being faced by ERP department:**

* Tech expertise in DB and analytics was scarce at CTCC – there were only 2 employees. There was need for more.
* ERP department is largely dependent on only Faith Lang. The department needs a backup for her, so that everything doesn’t come to a standstill in case she leaves tomorrow.

**Ray of hope:**

The ERP department is in good hands, esp. Faith Lang and she has proved her mettle time and again by helping the various departments in overcoming the BI reporting challenges. Not only that, ERP department is proactive too in approaching the departments and convincing them in adopting the use of BI tools developed by IT.

**Proposals:**

Following are a few proposals to overcome some of the problems:

**Lack of BI adoption among users/departments:** To overcome this problem there can be various strategies:

1. The adoption of the BI has to be mandated by the top/senior management and also should be made incumbent upon the department heads that all the relevant users start using the ERP/BI tools. If it is driven from the top/senior management the department personnel won’t take it as an optional exercise. In addition to that, if it is made a part of KPI and score cards of the department heads they would make sure that only BI/ERP tools are used for record keeping and reporting in their respective departments.
2. Only reports generated through the BI tool should be made acceptable for reporting purposes. i.e. there should be one single source of truth.
3. Those users/departments who adopt the BI tools should be recognized and rewarded publicly in town halls or newsletters.

**Duplication of data and different versions of same reports:** We can adopt few or all of the following strategies:

1. Form a Business transformation team who can oversee the execution and rollout of the BI features. The ERP department should be reporting to this team, or John McEwan maybe appointed as the head of this team. The head of BT team would be reporting directly to the General Manager (Dan Crawford) of CTCC and would act as a shared function for all other departments. This team should have stakeholders from all departments. Before a new feature/dashboard is created the stakeholders should brain storm among themselves in order to make sure that there is no duplication of data and reporting structures and hence there is a single source of truth. This team would also audit the existing reports and data in different departments and find ways to get rid of such duplicities.
2. External auditors should be hired at periodic intervals in order to audit the data structure and reporting features.

**Lack of attendance in training programs:** Most of the people are wary of adopting the BI software because they are not so tech-savvy and the only way to become one is to go through the training programs. We can adopt the following strategies to ensure this:

1. For every major rollout of a BI dashboard, an offline training program should be organized and all relevant people in the relevant departments should be mandated to attend this.
2. It should be made mandatory for the relevant employees to go through the online/offline training programs and subsequently undergo a dynamic online test and obtain certification. Certifications should be made a part of KPIs of the employees. If mandatory training and subsequent certification is made a part of KPI and employee score card, employees would make their own effort to go through the certifications
3. Regular updates, in the form of email or social media newsfeed, should be sent to the relevant potential/existing users of specific BI tools. Also, if the user is certified, he/she is more likely to read though the updates coming to him via email/social-media-newsfeed.

**Conclusion:**

If we follow the above suggested approaches, the organization would be able to overcome the problem of non-adoption of BI reporting tools. However, we also have to keep in mind the following factors:

1. Cost: It has to be noted that the formation of a business transformation team, organizing training programs etc. would attract costs. But, the costs incurred would be largely offset by the losses due to problems in project management or due to inefficient or delay in decision making due lack of proper reports.
2. Duration: This exercise is not going to be completed overnight and it has to be run as a pilot in one department and after successful completion in that department, it has to adopted in other departments too. Meanwhile, the organization would have to manage with the existing setup as a stop gap arrangement.

**Answers to specific questions:**

1. **How could the BI reporting development be mandated differently to avoid having to reconcile the large no. of reports being created?**

**Answer**: As mentioned before in previous sections, if the adoption of the BI is mandated by the top/senior management and made incumbent upon the department heads that all the relevant users start using the ERP/BI tools, then everyone would start falling in line. If it is driven from the top/senior management the department personnel won’t take it as an optional exercise. In addition to that, if it is made a part of KPI and score cards of the department heads they would make sure that only BI/ERP tools are used for record keeping and reporting in their respective departments.

1. **Could more training help to communicate the uses of the reports?**
2. **Answer:** Yes. As mentioned earlier, most of the people are wary of adopting the BI software because they are not so tech-savvy and the only way to become one is to go through the training programs. For every major rollout of a BI dashboard, an offline training program should be organized and all relevant people in the relevant departments should be mandated to attend this. Regular updates, in the form of email or social media newsfeed, should be sent to the relevant potential/existing users of specific BI tools. Also, if the user is certified, he/she is more likely to read though the updates coming to him via email/social-media-newsfeed.
3. **How could the users be motivated to use the new analytics tools?**

**Answer:** Only BI generated reports should be acceptable by senior management. That way it would also remain a single source of truth. Also those users who use these tools should be recognized and rewarded. There should be a deadline that should be fixed after which the pre-existing and silo-specific systems wont remain in the departments and plugs would be pulled out on them.

1. **Was it a proper use of BI platform to overcome some of the functionalities that the ERP and QA systems ought to provide?**

**Answer:** Yes. There is no hard line between the ERP and BI tool and most of the times, many ERP tools as well provide so many analytics features. Not only that, the ERP tools also provide ways to extend some analytics features. So, it was completely alright to do so.