

Business Process Reengineering : A Study in a Large and a Small Scale Manufacturing Organization

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Abstract

Business Process Reengineering brings a radical change to the operational setting of the organization. In this competitive environment, firms are competing with one another. The instrument of competition is nothing but changing initiative in their process. So a firm can attain competitive advantage by virtue of revamping the existing setup into a new structure where the competitiveness of the product can be focused upon to enable the firm to compete effectively. The paper begins with the conceptual frame work of Business Process Reengineering literature. A modest attempt has been made by taking two cases, one of a large scale industry, that is, Bhilai Steel Plant and another of a small scale sweet manufacturing firm called Kar & Brothers.

Key words: *Business Process Reengineering, strategy, competition and change*

Business Process Reengineering

Reengineering is the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance such as cost, quality, service, and speed. Davenport and Short (1990) define *business process* as “a set of logically related tasks performed to achieve a defined business outcome.” A process is “a structured, measured set of activities designed to produce a specified output for a particular customer or market. It implies a strong emphasis on how work is done within an organization” (Davenport 1993). In their view, *processes have two important characteristics:* (i) They have customers (internal or external), (ii) They cross organizational boundaries, i.e., they occur across or between organizational subunits. One technique for identifying business processes in an organization is the value chain method proposed by Porter and Millar (1985). Processes are generally identified in terms of beginning and end points, interfaces, and organization units involved, *particularly the*

customer unit. High Impact processes should have *process owners*. Examples of processes include: developing a new product; ordering goods from a supplier; creating a marketing plan; processing and paying an insurance claim; etc. Processes may be defined based on three dimensions (Davenport & Short 1990):

Entities: Processes take place between organizational entities. They could be Interorganizational, Interfunctional or Interpersonal.

Objects: Processes result in manipulation of objects. These objects could be physical or informational.

Activities: Processes could involve two types of activities: Managerial (e.g. develop a budget) and Operational (e.g. fill a customer order).

BPR Principles

Principle 1. Organize around outcomes, not tasks.

- Principle 2. Have those who use the output of the process perform the process
- Principle 3. Merge information-processing work into the real work that produces the information.
- Principle 4. Treat geographically dispersed resources as though they were centralized.
- Principle 5. Link parallel activities instead of integrating their results.
- Principle 6. Put the decision point where the work is performed, and build control into the process.
- Principle 7. Capture information once—at the source.

Where does *BPR* Apply?

BRP could be implemented in all firms (manufacturing firms, retailers, services, etc) and public organizations. These firms and organizations should satisfy the following criteria:

Strong management commitment to new ways of working and innovation

Well formed IT infrastructure

BPR could be applied to companies that confront problems such as the following:

High operational costs

Low quality offered to customers

High level of “bottleneck” processes at peak seasons

How is *BPR* Applied?

1. State a case for action
2. Identify the process for reengineering
3. Evaluate enablers of reengineering
4. Understand the current process

5. Create a new process design
6. Implement the reengineering process.

Implementing a *BPR* Strategy

Key Steps

- Select The Process & Appoint Process Team
- Understand The Current Process
- Develop & Communicate Vision Of Improved Process
- Identify Action Plan
- Execute Plan

Select the Process & Appoint Process Team

Two Crucial Tasks should be performed. They are : (1) Select the process to be reengineered and (2) Appoint the Process Team to lead the Reengineering Initiative.

(1) Select the Process

Business strategy and customer requirements are to be reviewed to select the core process and to understand the customer needs. Proper care should be taken not to assume anything and to select the correct path for change. Even we should remember that assumptions can hide failures and competition and choice can go elsewhere. So it is always better to ask through questionnaires, meetings and focus groups.

(2) Appoint the Process Team

- Appoint BPR Champion
- Identify Process Owners
- Establish Executive Improvement Team
- Provide Training to Executive Team

Understand the Current Process

To understand the current process a Process Overview should be developed which will clearly define the process including mission, scope and boundaries. Business and customer measurements are to be set to understand customers' expectations from the process (staff, including process team) and to clearly identify and to improve opportunities, quality and rework. Lastly they should be documented according to cost, time and value of data.

Develop and Communicate Vision of Improved Process

Communicate with all employees so that they are aware of the vision of the future. Always provide information on the progress of the BPR initiative - good and bad. Demonstrate assurance that the BPR initiative is both necessary and properly managed. Promote individual development by indicating options that are available. Indicate actions required and those responsible. Tackle any actions that need resolution. Direct communication to reinforce new patterns of desired behaviour.

Identify Action Plan

Develop an Improvement Plan and then appoint process owners to simplify the process to reduce process time and to remove no-value added activities and to standardize process and automate where possible to up-process. There should be enough plan or schedule about the changes. Any bureaucracy that may hinder implementation to be identified. Construct in-house metrics and targets should be removed. Lastly a feedback system should be introduced and firmly established.

Execute Plan

- Qualify/certify the process
- Perform periodic qualification reviews

- Define and eliminate process problems
- Evaluate the change impact on the business and on customers
- Benchmark the process
- Provide advanced team training

How does BPR Differ from TQM?

TQM and BPR share a cross-functional orientation. Davenport observed that quality specialists tend to focus on incremental change and gradual improvement of processes, while proponents of reengineering often seek radical redesign and drastic improvement of processes.

Davenport (1993) notes that *Quality management*, often referred to as total quality management (TQM) or continuous improvement, refers to programmes and initiatives that emphasize incremental improvement in work processes and outputs over an open-ended period of time. In contrast, *Reengineering*, also known as business process redesign or process innovation, refers to discrete initiatives that are intended to achieve radically redesigned and improved work processes in a bounded time frame.

Table 1 :
A Comparison of TQM and Reengineering

	TQM	Reengineering
Case for action	Assumed to be necessary	Compelling
Goals	Small scale, cumulative improvements in many places	outrageous
Scope and function	Attention to tasks, steps, and processes across the board.	Select but broad business process
Degree of change	Incremental and continual	Order of magnitude and periodic
Senior Management involvement	Important up front	Intensive throughout
Role of IT	Incidental	Cornerstone

BPR Challenges

Common Problems

- Process simplification is common - true BPR is not
- Desire to change not strong enough
- Start Point-the Existing Process, not a blank slate
- Commitment to existing processes too strong
- Quick Fix Approach

Common Problems with BPR

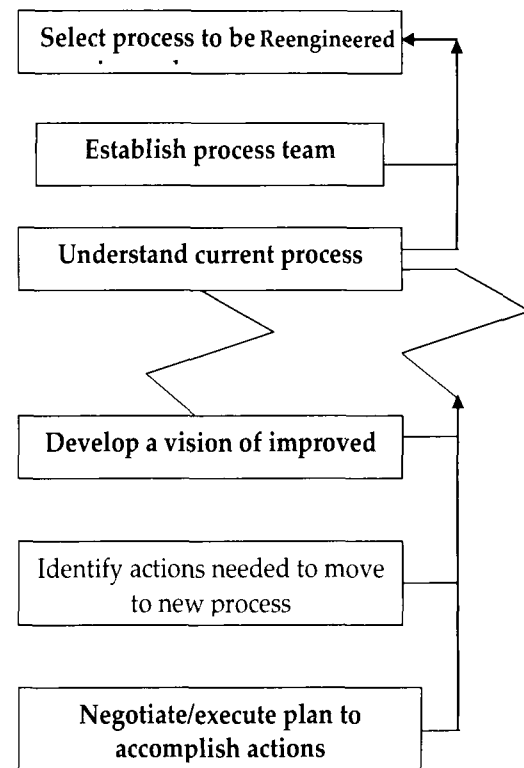
- Process under review too big or too small
- Reliance on existing process too strong
- The Costs of the change seem too large
- BPR-Isolated activity not aligned to the Business Objectives
- Allocation of resources
- Poor timing and planning
- Keeping the team and organization on target

Common Benefits of BPR

In enterprise integration, departments are consolidated and several jobs are combined into one job. In Worker empowerment there is both horizontal and vertical reorganization and handoffs are eliminated. There are fewer rules and less coordination is required. Number of steps in a process are reduced and the whole process is simplified. This is done mainly to reduce or eliminate inspection, checks and controls. The steps are performed in a more natural order. Processes differ by the type of job being processed. Not just one process but many are employed depending

on the size of the job. Work is performed where it makes the most sense. Reconciliation is minimized.

Figure 1 : Methodology for Business Process Reengineering



In today's ever-changing world, the only thing that doesn't change is 'change' itself. In a world increasingly driven by the three Cs: Customer, Competition and Change, companies are on the lookout for new solutions for their business problems. Recently, some of the more successful business corporations in the world seem to have hit upon an incredible solution. The typical characteristics of BPR include: the radical redesign of business processes; the deployment of information technology as an enabler; major disruption to the organization during the process of reengineering; and attempts at achieving organization wide improvements in performance.

CASE-I

A case on BPR application in BHILAI STEEL PLANT (A Large Scale Industry)

Bhilai Steel Plant (BSP) is India's sole producer of rails and heavy steel plates and major producer of structurals. The plant is the sole supplier of the country's longest rail tracks of 260 meters. With an annual production capacity of 3.153 MT of saleable steel, the plant also specializes in other products such as wire rods and merchant products. Since BSP is accredited with ISO 9001:2000 Quality Management System Standard, all saleable products of Bhilai Steel Plant come under the ISO umbrella. Business Process Reengineering in steel melting shops has not only provided a radical change in the profitability of Bhilai steel plant but also reduced and saved the working time.

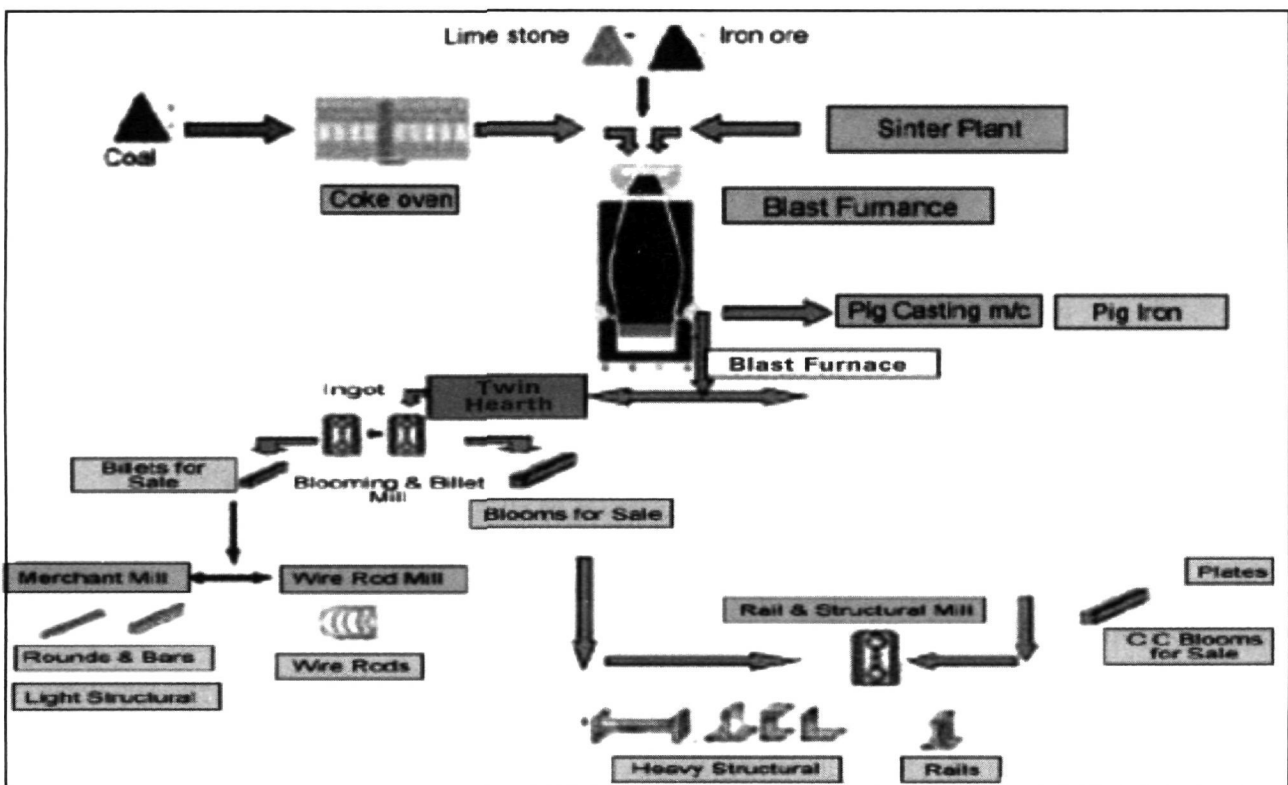
Bhilai steel plant is an integrated steel plant with following four major units-

- Coke Ovens- for production of Coke.
- Blast Furnace- for production of hot metal
- Steel Melting Shop- for conversion of hot metal to steel.
- Rolling Mills- for making, shaping and treating of steel in desired shape and size.

Metallurgical coal are charged in to Coke Oven and heated to about 1100°C in absence of air to produce metallurgical coke.. The coke thus produced is the main fuel as well as raw material for blast furnaces.

The coke produced is charged in the Blast Furnaces along with iron ore, sinter and fluxes to produce pig iron. In blast furnaces, air blast is given which takes part in reaction for production of iron ore to molten iron along with coke and other iron bearing material like lump ore, sinter and flux material. The pig iron produced from the blast furnaces is fed

Figure 2 : Flow chart of Steel Melting Shop



to the twin hearth furnaces of **Steel Melting Shop-1. (SMS-1)**

The steel produced from the SMS-1 is teemed into ingots, which are then transported to different mills for further processing by railway wagons. Before they are fed to Blooming Mill to make blooms they are again heated to a high temperature. Small quantity of blooms is then rolled to heavy structural in Rail & Structure mill. Main quantity of the blooms is rolled into billets in the billet mill. The billets of the suitable dimensions are further rolled into merchant products in merchant mill and wire rods in Wire Rod mill. The main drawback in this process was that the process was very costly as heating has to be done again and again before each process and the ingots which were transported with the help of railway wagons incurred huge cost and consumed time also.

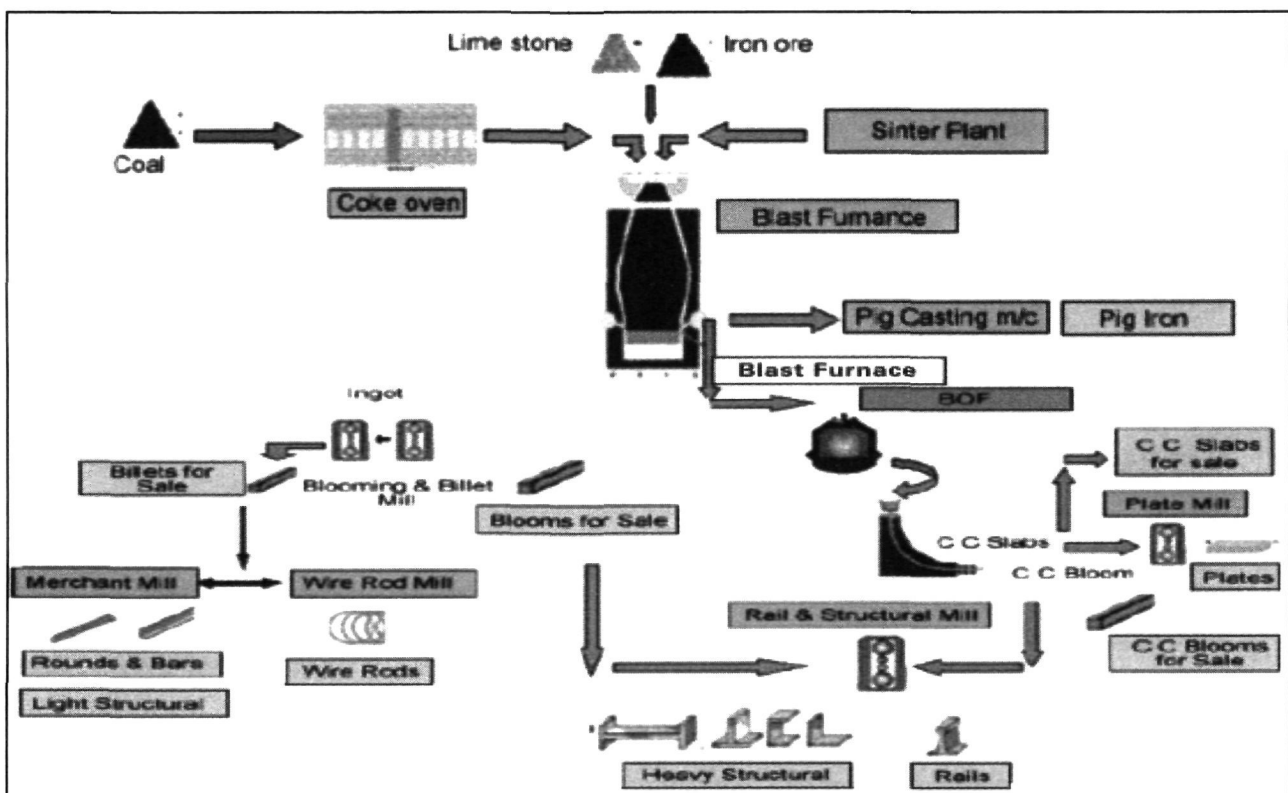
SMS-2 : A way to radical change.

Continuous Casting

Bhilai Steel Plant now uses continuous casting, which is more efficient. This technique allows molten steel from the ladle to be cast directly into the basic shape that the customer wants. By adjusting the water-cooled moulds in the continuous caster, steel sections can be produced in the three basic shapes shown below, slabs, blooms and billets.

The liquid steel produced from the Ladder converters is cast into Blooms/Slabs through continuous casting route, which is fed to the Plate Mill to make flat products and Rail mill to make rails. These blooms meet the stringent quality requirements of Indian Railways. Some benefits of using SMS-II for steel production are SMS -I takes 5.3 Hrs to produce 250 tonnes of steel while SMS-II

Figure 3 : Flow chart showing continuous cast of steel in SMS-2 using ladle technique.



produces 120 tonnes of steel in 45 minutes. Quality wise also steel From SMS-II is better. It produces steel with out internal cracks and therefore it is being used in making of boilers. SMS-II gives continues production of steel which is linked with other mills saves labour, time consumption and reheating of iron.

Some more advantages of this process are:

1. Increased yield (94 –97%)
2. Saving of Energy, Saving of floor area
3. Conversion time of Liquid steel in to bloom/ slab is reduced
4. Reduced operational cost
5. Better quality cast products
6. Soaking pit and primary mill are not required
7. Extensive automation possible

The steel industry is often regarded as a fully matured industry, using proven processes with only incremental technological developments. However, the past 30 years have witnessed several dramatic technological developments, which have changed the organizational structure, productivity, efficiency, and product properties of the steel industry. The new technologies will develop in parallel with continued incremental improvements in reliability and energy and materials efficiency of conventional processes

CASE-II

A case on application of BPR in sweet manufacturing firm of KAR & BROTHERS (Small Scale Firm)

Origin

Looking forward to gain some practical exposure about Business Process

Reengineering, I chose to visit the sweet manufacturing unit of M/s. Kar & Brothers, at Salepur, Orissa. The manufacturing unit is about 60 Kms. away from Bhubaneswar. According to the conversation which took place with Mr. Prashant Kar and Mr. Pradeep Kar, Joint-Directors of M/s. Kar & Brothers, they have only three outlets in Bhubaneswar. On a daily basis two company vehicles ply between the manufacturing unit and the company out-lets, one for the sweets and the other for bhujia (started two years back).

As the history of the company goes, in 1927, late Mr. Bikalananda Kar a modest trader laid the foundation of today's Kar & Brothers firm and it was registred with the govt. in 1954. His dedication and hard work strengthened this organisation. Now with motivated labour, quality management and modern technology Kar & Brothers is a pioneer in industry in confectionery and processed food manufacturing, with a potential to revolutionize the way the people think about sweets. The firm has numerous products like Rassogolla, Son Papdi, Mudki, Sandesh, Keshar Sandesh, Kalakand, Khua Burfi, Peda, Kaju Burfi, Mysure Pauk, Coconut Burfi & Sweet Curd.

Total Quality Management & Reengineering

In the early days of the company, popularity and the demand of the sweets of M/s. Kar & Brother's, Salepur, was not much but the same increased with the passing of time. To keep pace with the increasing demand and cost of labour, for smooth functioning of the manufacturing process and to maintain the quality and service to the customers, the process is modernized. But the process which is reengineered is not done to automate the whole process, not to downsize or to outsource.

Kar & Brothers have always believed in treading that additional step to ensure beyond doubt that the products are the finest possible, only the highest level of craftsmanship flows in to each product to give uncompromising quality with irresistible taste. For them sweets are not cooked they are crafted. The firm adheres to the strict quality control procedure, give its employees a conducive working environment, train them on quality control, safe manufacturing practice and food safety system. A sound quality control system, food safety management, food hygiene policy, identification and traceability of manufactured goods through batch numbers, preparation of analytical report and nutritional level of each and every finished product are the hallmarks of Kar & Brothers. They are a member of **APEDA (Agriculture & Processed Food Export Development Authority)** the premier trade organization of India. Their products are vacuum packed thus ensuring natural freshness with nutritional value. They do not contain any chemical additives. They are preserved in light sugar syrup for lasting freshness. Periodic introduction of latest mechanical methods of production and packaging is helping them to meet the growing demand.

The Final Result

At M/s. Kar & Brothers, Salepur, the whole process was done manually by the employees, right from procuring milk from different places to the manufacturing of sweets. The sweets were manufactured once in a day with the help of fuel. At that time it was difficult for the employees to work for hours as the working condition was not so congenial for them. The temperature which Fuel give, is around 80 - 90 Degree Centigrade where as Gas gives around 100 – 120 degree Centigrade. With the increasing cost and scarcity of fuel and Gas, the owners thought of changing Fuel

& Gas into STEAM. Steam generally gives out a temperature of about 160 Degrees Centigrade at a constant rate and moreover it doesn't disturb the working condition of the employees by heating up the surrounding. So, M/s. Kar & Brothers redesigned their Rassogolla manufacturing process fully by importing Rassogolla manufacturing machine from Taiwan. This does the work of preparing the round balls of paneer from raw materials of milk constituents & cardamom. From there, the paneer balls are transferred to the Steam-Oven and finally to the bucket of sugar syrup. Finally they are put inside the tin containers (which are procured from Delhi and rounded and put into shape by the employees with the help of a machine) and vacuum packed. The whole process is not automated but rather there is equal contribution of both machine and human being. From the process it is clear that no one is superior but both of them is dependent upon each other, which is making the process, faster, smother, easier & comfortable.

So, it can be said that the whole process has been redesigned keeping in mind the following factors:

- **Customers** – with their ever increasing demand and cater to their changing needs.
- **Competition** – with the rising number of small and big sweet manufacturing units and shops in and around Bhubaneswar and Salepur, Cuttack.
- **Change** – to change themselves with the rapid technological change and customer preference.

According to the joint directors of M/s. Kar & Brothers, Salepur, the change in the process is a success because of the presence of certain valid reasons. Most vital of them, is, they were able to communicate the benefits of process

reengineering to their employees, so there was less resistance to change from the employees part. In this regard the employees were educated and properly trained and they were assured that process reengineering doesn't mean downsizing, automation or outsourcing. Even, Kar & Brothers has never decreased their number of employees but rather they increased the number in due course. The employees work hand in hand with the machines to keep pace with the increasing demand of the customers. The employees work in shifts.

Looking at the success of reengineering the process of Rassogolla, Kar & Brothers have also reengineered "Sandesh" manufacturing process, from preparing the mix of cottage cheese, milk and sugar till the finished product. They are also looking forward to import "Kalla Jamun" Gas manufacturing unit from Hydrabad, India as well.

From the conversation and a short tour inside the manufacturing unit, a vivid difference has been noticed in respect to TQM (Total Quality Management) & Business Process Reengineering (BPR). For TQM, quality standard of the products is checked at every stage but at the same time for BPR it is a one time process. So far as the change is concerned, BPR is fundamental, which is done at the beginning but TQM is incremental. Kar & Brothers started the era of reengineering their process with importing of Rassogolla manufacturing machine, where the machine is fed with paneer and other ingredients and the machine will produce only the peaces of Rassogolla but the ultimate preparation is done by the employees. So it can be rightly said that BPR can make the whole process faster but ultimately it is the human being who will control and complete the process. Kar & Brothers has built a state of the art confectionery manufacturing environment to meet its marketing operation.

Conclusion

So in a company with TQM (Total Quality Management), Business Process Reengineering is heading towards the composition of Knowledge Management, Employee Empowerment, adoption of new ideas and shared vision.

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