

Need of Limber Bike in Indian Market

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Abstract— In India, currently available cycles are designed for niche market which are focuses for particular gender their physical attributes and usage pattern, thus utilization of these cycle becomes limited. So to design a unique bicycle which will cover all age group people and with different height and ergonomic requirement, segments form street bicycles to sports-off road. Cycle have main features like Variable wheel base, Seat vertical movement, Seat longitudinal movement, Seat axial movement, Handle height adjustment, Handle longitudinal angle adjustment, Light weight (Aluminum), Variable Pedal Length. Cycle should be for all age group, Unisex. To apply all the concepts of a limber bike, a sample bike on which it can be implementing was to be selected. After powerful market survey few bikes were shortlisted on which the limber bike can be developed. The parameters considered while selection of a benchmark bike were mainly dimensions, weight and cost. The bike shown in figure was finalized because it is simple in design, sturdy, light weight and practically assessed. The Limber bike concepts and linkages can now be implemented on this benchmarked bike and it can then be tested and validated rather than designing the entire bike from scrape. This will save significant amount of time and energy.

Key words: Bicycle Usage in World, Indian Bicycle industry And Sharing Schemes, Benchmarking

I. INTRODUCTION

Today in India we have variety of cycles from simple version to the classy sporty one. We also have cycles with different lengths, heights and inclination. Limber Bike is a unique product which has the potential to bring renaissance in cycle industry. This cycle as the name suggests is flexible, which can be converted into a sporty model from the simple model as and when needed. The driving position, length and height can also be changed as needed. It is a new arrival in cycle industry. The market for the premium or the lifestyle bikes targeted towards the lifestyle consumer is just about intensifying. The definition of high end bikes itself is changing. Earlier the high-end bikes were considered as those selling between Rs. 5000 to 8000. On the whole the future for Indian industry including Bicycle will be challenging. The domestic market will be open to good and services from global companies with low tariffs. Protection will be a thing of the past. The companies that will survive will be those which successfully restructure and modernize to achieve global competitiveness in terms of quality, cost and distribution system.

II. BICYCLE USAGE IN WORLD

The bicycle is an important means of transportation in most developing and under-developed countries like China, India and Vietnam. In the developed world, especially in the European and North American countries, however, bicycles

encompass multiple functions from basic transportation to sports.

Countries	Bicycles per 100 person
Netherlands	79
West Germany	74
Japan	49
United States	42
Australia	42
China	27
Mexico	16
South Korea	15
India	6
Malawi	1

Fig. 1: Bicycle usage in world

Global economic prosperity and seasonal factors heavily influence the bicycle industry. Economic downturns affect bicycle demand as well. China witnessed a erupt in production towards the end of the last decade as over 100 Taiwanese manufacturers shifted base to different Chinese cities because of the accessibility of cheap labour. The global trade in bicycles is estimated at around 30 million units, with Europe, North America and Japan secretarial for around 70% of it. a major portion of India's bicycle exports comprises standards due to the similar consumer demographics. Hero plans to increase India's presence in the high-end segment through its recent tie-up with Japan's National Bicycle Industries whereby it will produce high-end bicycles.

III. INDIAN BICYCLE INDUSTRY AND SHARING SCHEMES

The Indian bicycle market comprises two segments: "principles" and "specials". Standards are the workhorses of the rural economy. New classes of bicycles called juveniles, which are categorized in the specials segment, have overtaken the standards. The juvenile is, in effect, a standard bicycle with a more urban look, which is targeted at the rural and semi-urban youth. Manufacturers have also increasingly attempted to wean away consumers to the specials segment through greater marketing push and by attractively pricing specials. In the last six years, standards achieved double digit growth (12%) in just one year, 1999-2000, due to unusually large purchases by the state governments of Gujarat and Andhra Pradesh for free distribution. Ludhiana is the hub for bicycle manufacturing in India. More than 25,000 cycles per day are manufactured in Ludhiana alone. Accounting for 80% of the total production of bicycles. The total production of bicycles was of the tune of 15.018 million units in 2000-01 as compared to 37.000 units produced just after self-government yearly production of bicycles.

Growth in bicycle -sharing schemes and fleet 2000-2010

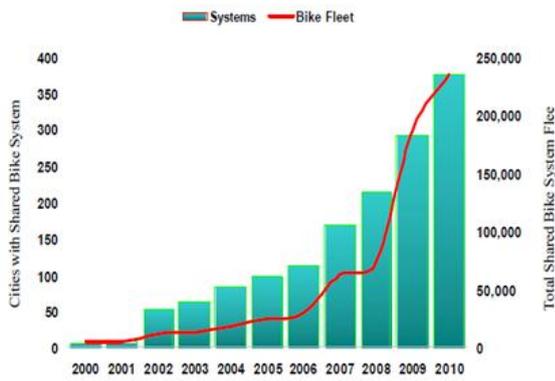


Table 1: Bicycle Sharing System

IV. DIFFERENT GESTURES OF BICYCLES

A. Conceptualization:

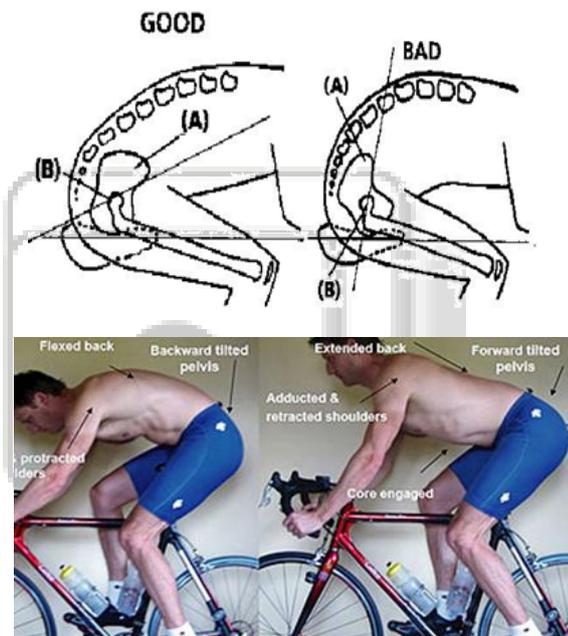


Fig. 2: Improper angle due to inappropriate body height with Bicycle frame size

B. Benchmarking:

The purpose of benchmarking is to improve product or services by identifying where changes can be made in the existing product or in what and how things are done. However, true benchmarking is more than just ranking you against others or creating relationship table. The parameters considered while selection of a benchmark bike were mainly dimensions, weight and cost.

Specifications	
Frame	Steel
Frame Size	26"
Brakes	Caliper (Rim Brakes)
Brakes lever	Plastic
Saddle	Comfort Air Flow saddle
Pedals	Plastic with Reflectors
Rims	Steel

Tires	Nylon Tire with Natural Rubber Moulded tubes
Wheel Size	26"
Gear System	Single Gear
Weight	14.5 kgs.

Table 2: Specifications of all parts

C. Bicycle Frame:

A bicycle frame is the main part of a bicycle, onto which wheels and other components are fixed. The modern and most common frame design for an upright bicycle is based on the safety bicycle, and consists of two triangles, a main triangle and a paired rear triangle. In the diamond frame, the main "triangle" is not essentially a triangle because it consists of four tubes: the head tube, top tube, down tube and seat tube. In a cantilever bicycle frame the seat stays continue past the seat post and curve downwards to meet with the down tube. The recumbent bicycle moves the cranks to a position forward of the rider instead of underneath, generally humanizing the slipstream around the rider without the characteristic pointed bend at the waist used by racers of diamond-frame bicycles (Acosta et al., 2010). A cross frame consists mainly of two tubes that form a cross. A truss frame uses supplementary tubes to form a truss. Examples include Humblers, Pedersen, and the one pictured. A Monocoque frame consists only of a hollow shell with no internal structure.

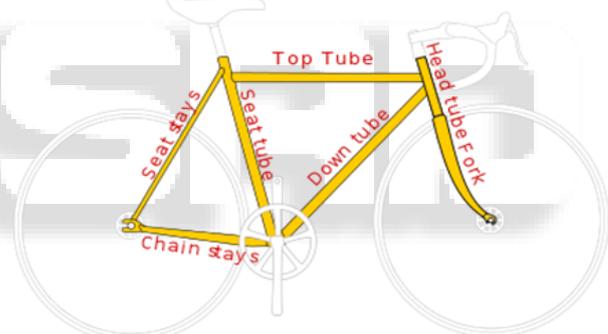


Fig. 3: Bicycle frame-set (frame and fork) schematic

Folding bicycle frames are characterized by the ability to fold into a dense shape for transportation or storage. Penny farthing frames are characterized by a large front wheel and a small rear wheel. Tandem and sociable frames support multiple riders.

D. Frame Tubes:

The head tube contains the headset, the bearings for the fork via its steered tube. The top tube or cross-bar connect the top of the head tube to the top of the seat tube. The down tube connects the head tube to the bottom bracket shell. The seat tube contains the seat post of the bike, which connects to the saddle.

E. Frame Geometry:

The length of the tubes and the angles at which they are attached define frame geometry. In compare dissimilar frame geometries, designers often compare the seat tube angle, head tube angle, (virtual) top tube length, and seat tube length.

F. Frame Size:

Frame size was conventionally measured along the seat tube from the centre of the bottom bracket to the centre of the top tube.

G. Bicycle Types:

- 1) Road and triathlon bicycles: A road racing bicycle is designed for efficient power transfer at minimum weight and drag. Triathlon- or time-trial-specific frames rotate the rider forward around the axis of the bottom bracket of the bicycle as compared to the standard road bicycle frame.
- 2) Track bicycle: Track frames have much in ordinary with road and time trial frames, but come with rear-facing, horizontal fork end rather than dropouts to allow one to adjust the location of the rear wheel horizontally to set the appropriate chain tension.
- 3) Mountain bicycles: For ride comfort and better treatment, shock absorbers are often used; there are a numeral of variants, counting full suspension model, which provide shock absorption for the front and rear wheels.
- 4) Roadster/utility bicycles: Roadster bicycles traditionally have a fairly loose seat-tube and head-tube angle of about 66 or 67 degrees, which produces a very comfortable and upright "sit-up-and-beg" riding position.

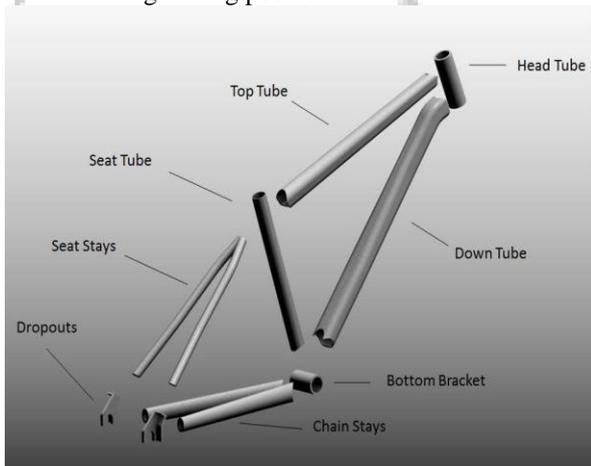


Fig. 4: Bicycle frame size

hands, the feet and the buttocks. Dynamic comfort is also in a straight line related to the quality of the road surface.

H. Adjustable Seat:

The seat stays connect the top of the seat tube (often at or near the same point as the top tube) to the rear fork dropouts.

I. Cost Analysis:

Sr No,	Description	Amount (INR)
1	Bicycle Frame	2000
2	Handle bar	1000
3	Handle bar	300
4	Mudguard	400
5	Wheel rim	700
6	Tire tube	800
7	Chain	150

8	Free wheel (rear)	100
9	Sprocket pedal bearing	400
10	Pedal	150
11	Seat	500
12	Brake set	300
13	Chain cover	200
14	Parking stand	150
15	Load carrier	150
16	Fastener & bearings	250
17	Lock set	150
	Total	7700

Table 3: Cost analysis data for limber bike

V. CONCLUSION

My aim is to design one bicycle for different age group and for different modes with aluminum frame. There have been large emphasize on developing solar technology for the use in automobile industry. Bicycle size is also one of the challenge for kids and family bicycle segment. So that I decided with guidance of my guide that we will try to make one product which cover majority all segments of Indian Bicycle Industry. Many main feature are concluded from my study like Variable wheel base, Seat vertical movement, Seat longitudinal movement, Seat axial movement, Handle height adjustment, Handle longitudinal angle adjustment, Light weight (Aluminum) ,Variable Pedal Length.

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