FRAMEWORK FOR FORECASTING DESIGN POSSIBILITIES

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FRAMEWORK FOR FORECASTING DESIGN POSSIBILITIES

by

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Submitted

in fulfilment of the requirements of the degree of Doctor of Philosophy

to the

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Dedicated to my Parents

my Wife, Richa

Saanidhya & Vaidehi, jewels of my life

CERTIFICATE

This is to certify that the thesis entitled **"Framework for Forecasting Design Possibilities"** being submitted by **Mr. Sugandh Malhotra**, to the **Indian Institute of Technology Delhi**, for the award of the degree of **Doctor of Philosophy**, is a record of bonafide research work carried out by him.

Mr. Sugandh Malhotra has worked under our guidance and supervision, and has fulfilled the requirements for the submission of the thesis, which to our knowledge, has reached the requisite standard.

The results presented in this thesis have not been submitted in part or in full, to any other University or Institute for the award of any degree or diploma.

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अज्ञानतिमिरान्धस्यज्ञानाञ्जनशलाकया।
चक्षुरुन्मीलितंयेनतस्मैश्रीगुरवेनमः॥

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ABSTRACT

A well-grounded approach to design forecasting would be beneficial to the evolution of human society. All societies require visionaries who can foresee evolving needs and predict emerging trends. Study of historical trends indicates that there are changing and growing expectations and propensities that govern new design developments. Every very new invention & innovation represented evolution of our social needs and expectations, changed behavior patterns, lifestyles and concerns. It also opened new technological solution space and design possibilities. A well grounded forecasting framework will enable the decision makers, leaders and industries to generate long-term policies, strategies and plans to bring desired and likely circumstances in close alignment with present potentialities and future challenges. Thus, it would help channel energy and resources collectively for a more planned and sustainable future.

This dissertation looks at various forecasting approaches used in the industry and evaluates their relevance and application while designing for future. The researcher identified considerations/parameters that tend to maximize propensity for impactful and successful product solutions. These considerations/parameters can be further grouped together under human, technological and environmental considerations/opportunities.

The researcher followed a multi-pronged search through historical study of modern design movements, successful products from the past century and award winning contemporary products to identify these design considerations/parameters. Word content analysis of recent technical literature and brainstorming workshops were also conducted. Multiple level assessments and surveys/statistical analyses through SPSS software were carried out to ascertain the varying relevance of three categories, each with multiple parameters, verified across product categories and extent of future.

The findings were used to propose a comprehensive Design Futures (DeF) framework that can be used for forecasting design possibilities. This can be of immense help in exploring meaningful design possibilities and developing innovations for a sustainable and better future for all.

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ABBREVIATIONS	FULL FORM
%	Percent
AM	Additive Manufacturing
CSR	Corporate Social Responsibility
E.g.	For Example
EU	European Union
FD	Frequency Distribution
Fig	Figure
FMCG	Fast Moving Consumer Goods
GNP	Gross National Product
GSM	Google Scholar Metrics
Hrs	Hours
IIT DELHI	Indian Institute of Technology Delhi
IDDC	Instrument Design and Development Centre
LCA	Life Cycle Assessment
LESE	Laws of technical evolution
LTF	Long term Forecasting
MTF	Mid term Forecasting
POS	Part-Of-Speech
STF	Short term Forecasting
TASA	Technological approach, system or artifact
TC	Technological Change
TI	Technology Innovation
TFIDF	Term Frequency-Inverse Document Frequency
TLC	Technology life cycle
UV	Ultra Violet
viz	That means; or that are
w.r.t.	With Regards To