

MEASURE, MANAGE & FACILITATE CHANGE TO HARNESS ORGANIZATIONAL POTENTIAL

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INSTITUTE OF MANAGEMENT, GWALIOR
UGC NAAC ACCREDITED 'A' GRADE INSTITUTE

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First Published, 2018

ISBN : 978-93-86608-56-7

Printed in India:

BHARTI PUBLICATIONS

4819/24, 3rd Floor, Ansari Road, Darya Ganj
New Delhi-110002

Mobile : +91-9899897381

E-mail : bhartipublications@gmail.com
info@bharatipublications.com

Website: www.bhartipublications.com

Branch Office:

G-2, 5/744, Vaishali, Ghaziabad, U.P.-201010

Published by Onkar Bharti for Bharti Publications.

Typeset by Gaurav Graphics, Printed at Rajouria Offset, Delhi.

8. Analysis of Variations in Agriculture Sector Output in Jammu & Kashmir State Economy (1981-2011) <i>Muddasir Ali Mir & Dr. Santa Jain</i>	553-560
9. Assessing an Investor's Decision to Invest in Solar Power Across Indian States <i>Suranya Sharma</i>	561-582
10. Prospects and Challenges of Women Boutique Enterprises in Make in India Paradigm with Special References to Allahabad Division <i>Niharika Srivastava, Dr. Srishti Purwar & Prof. Jagdish Narayan</i>	583-595
11. Changing Paradigm in Rural Market & their Structures <i>Love Patel</i>	596-600
12. Indian Agriculture Vicissitudes Challenges and Opportunities <i>Dr. Anita C. Sikarwar</i>	601-605
13. The Cost benefit Analysis & Economic Marketing Strategies: A Study on Online Marketing at Amazon <i>G. Geethanjali</i>	606-614
14. Impact of Recent Economic Reforms GST and Demonetization on Indian Textile & Apparel Industry <i>Sumedha Sharma</i>	615-619

SECTION - V

INFORMATION TECHNOLOGY

15. The Study of Big Data Analytics: The Potential for Innovation & E-commerce Growth <i>Mahendra Singh Yadav</i>	623-630
16. Review of Worm Hole Attack in MANET <i>Divya Goyal</i>	631-638
17. Automatic Human Facial Emotions & Gesture Recognition using Soft Computing Techniques <i>Santa Jain Goyal, Rajeev Goyal, Pankaj Kumar Mishra & Mahendra S. Yadav</i>	639-645
18. Removal of Noise from MRI Images Using Image Processing Techniques in MATLAB <i>Vanshika Gupta & Rajal Bansal</i>	646-650
19. Application of Graph Theory in World Wide Web <i>Sanjay Kumar Bisen</i>	651-655
20. Application in Operation Research of Transportation Problem <i>Priyanka Swarupar</i>	656-662
21. An Agile Optimal Orthogonal Additive Randomized Response Model <i>Tanveer A. Tarray</i>	663-673

An Agile Optimal Orthogonal Additive Randomized Response Model

Tanveer A. Tarray¹

ABSTRACT

In this chapter a new additive randomized response model has been proposed. The properties of the proposed model have been studied. It has been shown theoretically that the suggested additive model is better than the one envisaged by Singh (2010) under very realistic conditions. Numerical illustrations are also given in support of the present study.

Keywords: Randomized Response Sampling, Estimation of Proportion, Sensitive Variable.

INTRODUCTION

One problem with research on high – risk behavior is that respondents may consciously or unconsciously provide incorrect information. In psychological surveys, a social desirability bias has been observed as a major cause of distortion in standardized personality measures. Survey researchers have similar concerns about the truth of survey results/ findings about such topics as drunk driving, use of marijuana, tax evasion, illicit drug use, induced abortion, shop lifting, child abuse, family disturbances, cheating in exams, HIV/AIDS, and sexual behavior. The most serious problem in studying certain social problems that are sensitive in nature (e.g. induced abortion, drug usage, tax evasion, etc.) is lack of reliable measure of their incidence or prevalence. Thus to obtain trustworthy data on such confidential matters, especially the sensitive ones, instead of open surveys alternative procedures are required. Such an alternative procedure known as “randomized response technique” (RRT) was first introduced by Warner (1965). It provides the opportunity of reducing response biases due to dishonest answers to sensitive questions. As a result, the technique assures a considerable degree of privacy protection in many contexts. Following the pioneering work of Warner (1965), many modifications are proposed in the literature. A good exposition of developments on randomized response techniques could refer to Fox and Tracy (1986), Singh and Mathur (2004, 2005), Gjestvang and Singh (2006) and Singh and Tarray (2013, 2014). We below give the description of the model due to Singh (2010):

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