DEPARTMENT OF STATISTICS

STUDENT STUDY PROJECTS 2020-2021

S.NO	Title of the project	Namer of the stdents involved	Group	H.T.NO.	Guided by
1	P.C.MAHALNOBIES	B.DURGA PRASAD	II M.S.CS	26204602	K.HARIPRIYA
		D.VIVEKANANDA	II M.S.CS	26204607	
		G.MOUNIKA	II M.S.CS	26204611	
		G.S.V.KRISHNA	II M.S.CS	26204612	
		U.RAMESH	II M.S.CS	26204628	
		K.LAVANYA	II M.S.CS	26204617	
		J.KALYAN	II M.S.CS	26204613	
		CH.VIJAYA LAKSHMI	II M.S.CS	26204606	
		R.SHASHI KUMAR	II M.S.CS	26204623	
		G.KARTHEEK	II M.S.CS	26204610	
2	WALTER ANDREW SHEWHART	Y.SAIDULU	I M.S.CS	26214642	K.HARIPRIYA
		Y.YAMUNA	I M.S.CS	26214643	
		P.VENU SAGAR	I M.S.CS	26214628	
		K.REVANTH KUMAR	I M.S.CS	26214615	
		P.RANJITH	I M.S.CS	26214632	
		M.TARUN	I M.S.CS	26214622	
		J.PAWAN	I M.S.CS	26214613	
		Y.SAMITHA	I M.S.CS	26214644	
		S.AKHIL	I M.S.CS	26214636	
		P.VINAY	I M.S.CS	26214627	

SR & BGNR GOVT. ARTS & SCIENCE COLLEGE (A) KHAMMAM

DEPARTMENT OF STATISTICS

STUDENTS' STUDY PROJECT:: 2020-21

Title : Father of Indian Statistics

- Prof. Prasanta Chandra Mahalanobis

Undertaken by

G. Surya Venkata krishna,
U. Ramesh, B. Durga prasad
K. Lavanya. D. Vivekananda
J. kalyan, G. Mounika
R. Shashi kumar
ch. Vijaya Lakshmi. G. kartheek.

Under the supervision of

K. HARIPRIYA

Lecturer in Statistics

Topic Name :- Father of Indian Statistics

Prof. Prasanta Chandra Mahalanobis

⇒ Father of Indian Statistics

⇒ Early life

⇒ Family

⇒ Education

⇒ Early Career

⇒ Life Companion

⇒ Influnce of great minds

⇒ Establishment of Indian Statistical Institute

⇒ Contribution to the field of statistics

⇒ Start of a new era :
introduction of computers

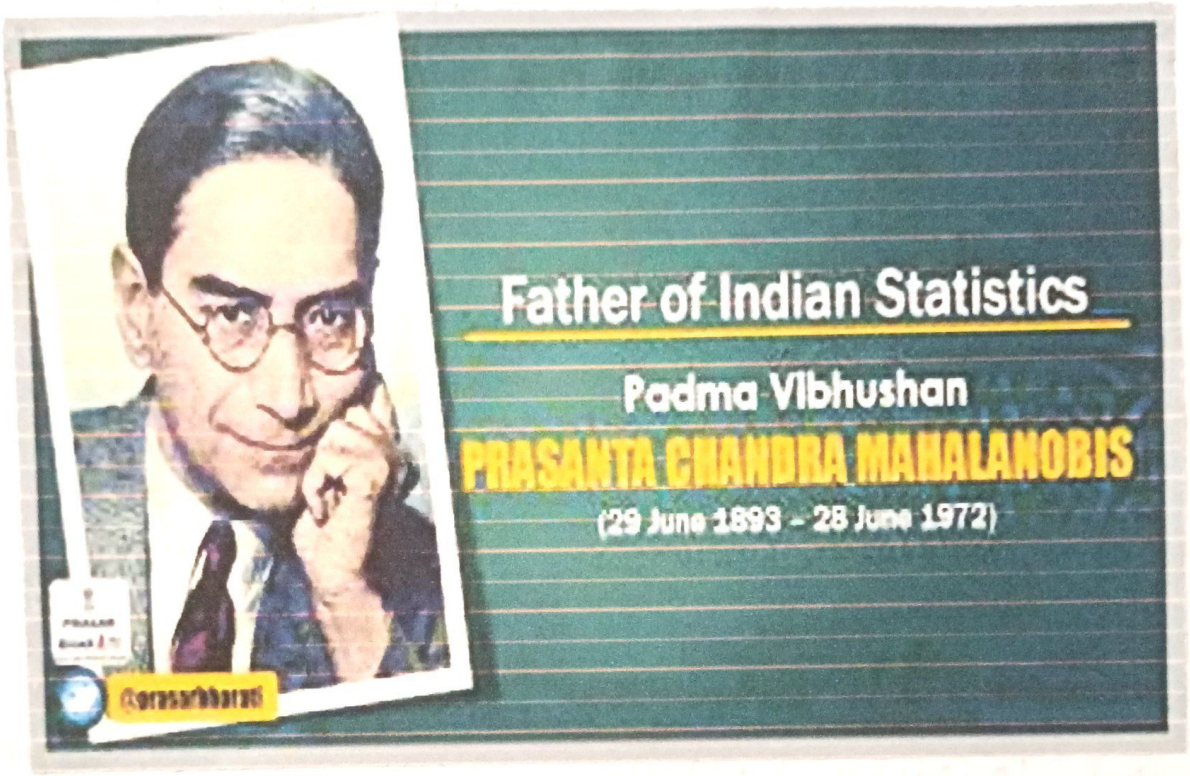
⇒ Contribution of ISI Excavation of a dinosour

⇒ Contribution to national development.

⇒ Dignitaries at ISI

Father

of Indian Statistics



Prof. Prasanta Chandra Mahalanobis is also known as the father of Indian Statistics. He was a physicist by training, a statistician by instinct and a planner by conviction. His contributions were massive on the academic side as the builder of the Indian Statistical Institute, organizer of the indian Statistical systems, Pioneer in the applications of the indian statistical techniques to practical problems, architect of the indian

Second Five year plan, and much more Statis
Science Pixie was a Virgin field and practica
unknown in india before the twenties. Develop
Statistics was like exploring a new territory
it needed a pioneer and an adventurer like
him, with his indomitable courage and tenac
of fight all opposition, clear all obstacles, an
throw open wide pastures of new knowledge fo
the advencement of Science and Society.

Early Life

Prof. Prasanta Chandra Mahalanobis was Born to an academically oriented family, mahalanobis pursued his early education in calcutta (now Kolkata).

Prof. Prasanta Chandra Mahalanobis was born into a family well established in calcut (Kolkata) who were relatively wealthy and whose members were enter prising, adventurous imbused with liberal Brachmo Samaj traditions

and active in all Bengali life.

Family

Prof. Prasanta Chandra Mahalanobis actual Surname was "Bandyopadhaya", Possibly Six generations before, Guru Charan Mahalanobis started using the Surname Mahalanobis as he was appointed to keep the accounts of land and land revenue of mahal of ancient Bengal. They knew him as "Nauvice". In persian "Nauvice" means Scribe of mahal (A mughual admin strative unit). So his Surname "Mahalanobis" come from the concept of "Mahal" and "Nauvice" prasanta Chandra Mahalanobis's roots were in panchasar Village now in Vikra mpur Bangladesh. prasanta chandra Mahalanobis grand father was Guru Charan Mahalanobis who was follower of Sadharan Brahmo Samaj.

Education

He started his education at Brahmo Boys School which was founded by his grandfather Guru Charan Mahalanobis in 1904

Early Career

He first joined presidency College in 1915 as a temporary professor in 1922 he become Asst. professor of physics and thought physics for 33 years (1915-1948) He was also the principal of presidency College for a few years and held the post of meteorologist in the Alipore observatory in calcutta from 1922 to 1926.

Life Companion

Prof. prasanta Chandra Mahalanobis married Nirmal kumari (nick named Rani), who who was the daughter of puritan Brahmo leader and educationist of Bengal Heramba Chandra Moitra.

Influence of great minds

Rabindranath Tagore, Prof. prasanta Chandra Mahalanobis, and Nirmal Kumari Mahalanobies shared a unique relationship. Rabindranath Tagore used to take interest in prof. prasanta Chandra Mahalanobis statistical work from the very begining Even has Career in Statistics was very largely influenced the Poet.

Establishment of Indian Statistical Institute

At the time prof. prasanta Chandra Mahalanobis was a professor of physics at presidency College, he was highly involved in the work of statistics. He setup the statistical laboratory in the baker laboratory of presidency college, Calcutta, in the early 1920's in the initial phase, his statistical research was in anthropometry, in meteorology and in problems of flood control in north Bengal and Orissa.

Contribution to the field of Statistics.

The anthropometric studies led to the formulation of D_2 - Statistic, known in statistical literature as Mahalanobis Distance which has proved to be a valuable tool not only in taxonomy but in many other fields including economics and geology. A rich field of research in multivariate analysis opened up; Sir Ronald Aylmer Fisher (R. A. Fisher) accepted this concept by giving it the name

"Mahalanobis D-square" or "Mahalanobis distance"

Start of a new era:

introduction of Computers.

Prof. prasanta Chandra Mahalanobis was one of the first people in the country to recognize the importance of machines - mechanical, electrical as well as electronic to make fast, accurate and complicated calculations with

masses of figures. in the 1950'S prof. prasanta Chandra Mahalanobis arranged to have a large number electromechanical data prosessing machines from IBM the Hallerith and the power Samas varieties were installed to process NSS data. Through his initiative in 1953, a small analog Computer was designed and built in the Institute.

Contribution of ISI:

Excavation of a dinosour

In 1957, prof. prasanta Chandra Mahalanobis invited Dr. parmela Robinson of the university College londan to the ISI to set up the geological Studies unit. The team under the leadership of Dr. Pamela Robinson discovered for the first time in india the fossil bones of the giant prehistoric lizard; the largest animal that lived on the earth.

Contribution to national development

Prof: Prasanta Chandra Mahalanobis. played an importent role in Indian National Economic planning He took major responsibility in draftin the second Five year plan for india, He belived i perspective planning and used simple logical ideas in deriving an economic model for plan -ng in a under developed Country like India.

Dignitaries at ISI

The growing importance of the institute was reflected in the continuous inflow of visitors Over a thousand leading Scientists of the wor visited the indian Statistical institute, ma of these Scientists Spent long periods of tim at the institute and often stayed with mahalanobis at his residence.

International liasions with ISI

As the Indian Statistical in-stute started earning internatial fame, prof. prasanta chan -dra mahalanobis worked for was becoming more and more preoccupied with assignment

Outside. Prof. Prasanta Chandra mahalanobis worked for International understanding and collaboration in scientific reach with foreign scientists.

Awards and accolades

Prof. Prasanta Chandra Mahalanobis received a number of awards and honors in india and abroad for this oustanding and fundamental contribution of statistics and planning.

SR & BGNR GOVT. ARTS & SCIENCE COLLEGE (A) KHAMMAM

DEPARTMENT OF STATISTICS

STUDENTS' STUDY PROJECT:: 2020-21

Title : Walter Andrew Shewhart.

Undertaken by

Y. Sidhulu, M. Tarun,
Y. Yamuna, J. Pawan,
P. Venu Sagar Y. Samitha,
K. Revanth S. Akhil,
P. Ranjith P. Vinay.

Under the supervision of

K. HARIPRIYA

Lecturer in Statistics

Walter * Andrew * Shewhart *

=> Scientific career
=> W. Edwards Deming said of him
=> work on industrial quality.
=> later work
=> Influence.
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=> works
=> References.
=> Further reading.
=> External links.
=> control charts.
=> common cause and special cause.
=> Analytic and enumerative statistical studies.

Walter Andrew Shewhart :-

Walter Andrew Shewhart (pronounced like "shoe-heart"; March 18, 1891 - March 11, 1967) was an American physicist, engineer and statistion, sometimes known as the father of "statistical quality control" and also related to the "shewart cycle"

Walter Shewhart (1891-1967)

- Western Electric & Bell Telephone Engineer
- Father of Statistical Quality Control (SQC)
- Founder of the Control Chart (e.g. X-bar R chart)
- Originator of PDCA cycle
- ASQC (American Society for Quality) 1st Honorary Member 1947

shewhart born in March 18, 1891 in New canton, Illinois, U.S. Died in March 11, 1967. Troy Hills, New Jersey, U.S. Almamater in university of Illinois, university of California, Berkeley.

Scientific Career :-

Fields in physics engineering, statistics Institutions in western electric. Influenced in W. Edwards Deming.

W. Edwards Deming said of him :-

As a statistician he was, like so many of the rest of us, self-taught, on a good back ground of physics and mathematics.

Born in New canton, Illinois to Anton and Esta Barney Shewhart, he attended the university of Illinois at urbana-champaign before being awarded his datorate in physics from the university of California Berkeley. in 1917, He married Edna Elizaben the Hart, daughter of William Nathaniel and isabell "Ibie"

Lippencott Hart on August 4, 1914 in pike county, Illinois.

Work on industrial quality :-

Bell Telephone's engineers had been working to improve the reliability of their transmission systems. In order to impress government regulators of this natural monopoly with the high quality of their services. Shewhart's first assignment was to improve the voice clarity of the carbon transmitters in the company's telephone hand sets. Later he applied his statistical methods to the final installation of central station switching systems. then to factory Production. When Shewhart joined the western electric company inspection Engineering Department at the Hawthorne works in 1918, industrial quality was limited to the inspecting finished products and removing defective items.

Shewhart worked to advance the thinking at "Bell Telephone Laboratories" from their foundation in 1925 untill his retirement in 1956, Publishing a series of papers in the Bell System Technical Journal.

His work was summarized in his book Economical control of Quality of manufactured Product (1931)

Shewhart's charts were adopted by the American society for Testing and materials (ASTM) in 1933 and advocated to improve Production during world war II in American war standards Z1, 1-1941, Z1, 2-1941 and Z1.3-1942.

Later work :-

From the late 1930s on wards, Shewhart's interests expands out from industrial quality to wider concerns in science and statistical inference. The little of his second book, Statistical method from the viewpoint of Quality control (1939). asks the question "what can statistical practice, and question, "what can statistical practice, and science in general, learn from the experience of industrial quality control ?"

His more conventional work led him to formulate the statistical idea of tolerance intervals and to propose his data presenti

rules, which are listed follow.

1. Data have no meaining apart from their context.

2. Data contain both signal and noise. To be able to extract information. one must seperated the signal from the noise with-in the data.

Shewhart visited india in 1947 - 1948 under the sponsorship of P.C. mahalanobis of the indian statistical institute, He tare-d the country, held conferences and stimulated interest in statistical quality control among Indian industrialists He died at Troy Hills, New Jersey in 1967.

Influence :-

In 1938 his work came to the attentio-n of physicists. W. Edwards. Deming and Raymond T. Birge. The two had been deeply intrigued by the issue of measurement error in science and had publised a land mark paper in Reviews of modern.

physics in 1934, on reading of shewhart insights, they wrote to the journal to wholly recast their approach in the terms the shewhart advocated.

To celebrate his quasquicentennial (125th) birth anniversary, the journal Quality Technology and Quantitative management (ISSN 1684-3703] published a special issue in on "Advances in the theory and Application of statistical process control"

Achievements and honours :-

In his obituary for the "American statistical Association", Deming wrote of shewhart;

As a man, he was gentle, genteel, never ruffled, never off his dignity, he knew disappointment and frustration, through failure of many writers in mathematical

Works :-

* 1917 ; A study of the Accelerated motion of small Drops through a viscous medium ph. D. dissertation via Hathi Trust
* 1931 : The Economic Control of manufacutured product D. van Nostrand company via internet Archive.

* 1939 : (with W. Edwards Deming) statistical method from the view point of Quality control . The Graduate school, U. S. Department of Agriculture via internet Archive

References :-

*. ^ Deming, W. Edwards (1967). "Walter A. Shewhart, 1891 - 1967". The American statistician. 21 (2) : 39 - 40.

doi : 10.1080/00031305.1967.10481808 ↗.

JSTOR 1401495 ↗

statistical to understand his point of view.

His honours included

* Founding member, fellow and president of the institute of mathematical statistics.

* Founding member first honorary member and first shewhart medalist of the American society for Quality.

* Fellow and president of the American statistical association.

* Fellow of the international statistical institute

* Honorary fellow of the Royal statistical society.

* Holley medal of the American society of mechanical Engineers.

* Honorary Doctor of science, India statistical institute, calcutta.

* ^" Western Electric - A Brief History". The Porticus Centre. Archived from the original on 2011-02-03. Retrieved 2009-04-10.

* ^ Neave, Henry R.; British Deming Association (1992). Why SPC?. Knoxville, Tennessee: SPC Press. ISBN 978-0-945320-17-3.

* ^" A Brief History of the Indian statistical institute" ↗ Archived ↗ 2006-06-18 at the Wayback Machine

* ^ Pruitt, W. Frazier; Imam, S.M. Waqas. "Expert Answers: April 2021" ↗. Quality Progress 54(4): 6. Retrieved 23 June 2021

* ^ Min Xie & Amitava Mukherjee (2017) "Quasquicentennial of birth of Shewhart", Quality Technology and Quantitative Management 14(4)

doi: 10.1080/16843703.2017.1304033 ↗

Further reading :-

* Bayart, D. (2001). Walter Andrew Shewhart, statisticians of the centuries (ed. C.C. Heyde and E. Seneta) pp. 398-401. New York: Springer.

* Bayart, D. (2005), "Economic control of quality of manufactured product" in Grattan Guinness, I., ed., Landmark writings in western mathematics, Elsevier, 926-35.

* Fagen, M.D, ed. (1975) A History of Engineering and science in the Bell system; The Early years (1875 - 1925).

* Fagen M.D, ed. (1978) A History of Engineering and science in the Bell system: National service in war and peace (1925 - 1975) ISBN 0-932764-00-2.

* Wheeler, Donald J. (1999). Understanding variation: The key to managing chaos, 2nd ed. SPC Press, Inc. ISBN 0-945320-53-1.

External links :-

* walter A. shewhart ↗ at American society for Quality.
* walter A. shewhart ↗ at portraits of statisticians.

Control charts :-

control charts, also known as shewhart charts (after walter A. shewhart) or process-behavior charts, are a statistical process control tool used to determine if a manufacturing or business process is in a state of control. it is more appropriate to say that the control. It is more appropriate to say that the control charts are the graphical device for statistical process monitoring (SPM). Traditional control charts are mostly designed to monitor process monitoring parameters when underlying from of the process distributions are known. However, more advanced techniques are available in the 21st be century where incoming data streaming can be monitored

even without any knowledge of the underlying process distributions.

Distribution-free control charts are becoming increasingly popular.

Common cause and special cause :-

Common and special cause are the two distinct origins of variation in a process. as of walter A. shewhart and W. Edwards Deming. Briefly, "common causes", also called natural patterns, are the usual, historical, quantifiable variation in a system, while "special causes" are unusual, not previously observed non-quantifiable variation.

The distinction is fundamental in philosophy of statistics and philosophy of probability, with different treatment of these issues being a classic issue of probability interpretations, being recognised and discussed as early as 1703 by Gottfried Leibniz; various alternative names have been used over the years.

The distinction has been particularly important in the thinking of economists Frank knight, John maynard keynes and G. L. S. Shackle.

Analytic and enumerative statistical studies:-

Analytic and enumerative statistical studies are two types of scientific studies:
In any statistical study the ultimate alim is to provide a rational basis for action. Enumerative and analytic studies differ by where the action is taken. Deming first published on this topic in 1942. Deming summarized the distinction between enumerative any analytic studies as follows.

Enumerative study: A statistical study in which action will be taken on the material in the frame being studied

Analytic study : A statistical study in which action will be taken on the process or cause-system the produced the frame being studied. The aim being to improve practice in the future.