Meaningful Analysis of profile of DNB Final Examination candidates using a Business Intelligence tool

**A dissertation submitted in partial fulfillment of the requirements
for the award of**

Post Graduate Diploma in Health and Hospital Management

by

Dr. Manish Jain (PT)

International Institute of Health Management Research

New Delhi

May, 2013

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Certificate of Internship Completion

Date: 1/4/2013.

TO WHOM IT MAY CONCERN

This is to certify that Dr. Manish Jain (PT) has successfully completed his 3 months internship in our organization from January 01, 2013 to April 01, 2013. During this intern he has worked on **"Meaningful Analysis of profile of DNB Final Examination candidates using a Business Intelligence tool"** under the guidance of me and my team at National Board of Examinations.

We wish him/her good luck for his/her future assignments

(Signature) _____ (Name)

_____ Designation

आर० सी० खत्री / R.C. KHATRI
सहायक निर्देशक / Assistant Director
राष्ट्रीय परिक्षा बोर्ड / National Board of Examinations
स्वास्थ्य एवं परिवार कल्याण मंत्रालय, भारत सरकार
(Ministry of Health & Family Welfare, Govt. of India)
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Name of the Student: Dr. Manish Jain (PT)

Dissertation Organization: National Board of Examinations under Ministry of Health & Family welfare

Area of Dissertation: Department of Academics, Department of Result, Department of Accreditation

Attendance: Complete

Objectives achieved: Completion of tasks with sincerity
Timely Completion of Projects assigned
Timely submission of reports and documents

Deliverables: "Meaningful Analysis of profile of DNB Final Examination candidates using a Business Intelligence tool"

Strengths: Good Managerial Skills
Good communication skills
Time Management
Professionalism
Multitasking

Signature of the Officer-in-Charge/ Organisation Mentor (Dissertation) (Dr. Vinay Gupta)
Date: 25/06/13
Place: New Delhi
AD (m)

Certificate of Approval

The following dissertation titled "**Meaningful Analysis of profile of DNB Final Examination candidates using a Business Intelligence tool**" is hereby approved as a certified study in management carried out and presented in a manner satisfactory to warrant its acceptance as a prerequisite for the award of **Post- Graduate Diploma in Health and Hospital Management** for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed or conclusion drawn therein but approve the dissertation only for the purpose it is submitted.

Dissertation Examination Committee for evaluation of dissertation

Name	Signature
Avanish Kr. Singh.	
Dr. Amravathi Ramachandran	

4

Certificate from Dissertation Advisory Committee

This is to certify that Dr. Manish Jain (PT), a graduate student of the Post- Graduate Diploma in Health and Hospital Management, has worked under our guidance and supervision. He/She is submitting this dissertation titled "Meaningful Analysis of profile of DNB Final Examination candidates using a Business Intelligence tool" in partial fulfillment of the requirements for the award of the Post- Graduate Diploma in Health and Hospital Management.

This dissertation has the requisite standard and to the best of our knowledge no part of it has been reproduced from any other dissertation, monograph, report or book.

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Abstract

Meaningful Analysis of profile of DNB Final Examination candidates using a Business Intelligence tool

by

Dr. Manish Jain (PT)

National Board of Examinations (NBE) at present conducts postgraduate and postdoctoral examinations in approved specialties leading to the award of Diplomate of National Board. Candidates registered with NBE as a DNB trainee or in possession of MD/MS in the concerned specialty can appear in the DNB Final Examination after completing their requisite training. NBE conducts examination in 62 specialties for both broad specialty and super specialty courses for which on an average 6000 candidates appear every time. This study was focused on using a Business Intelligence tool for the data collected about the profile of the candidates appearing in DNB Final Examination.

The Business Intelligence Tool (BI Tool) which was used for this analysis is Ideal Analytics. This is a first attempt of utilization of a BI tool for meaningful analysis of data about candidates appearing in DNB Final Examination. This analysis gave us an overview about the pattern of increase in number of medical practioners possessing DNB qualification (Broad Specialty and Super Specialty) all over India. The use of a BI tool in this analysis helped us to explore the data in much greater details and depth, providing us much more information and knowledge.

The key findings are:

1. Maximum number of candidates enrolling for DNB Final Examination belonged to Maharashtra, while on zonal distribution maximum number of candidates came from the South Zone.

2. Maximum number of candidates enrolling for DNB Final Examination was in the age group 31-35, except for the session of December 2012 where the candidates were in the age group 25-30.

3. Out of all the candidates enrolling for DNB Final Examination, 60% of them were male.

4. Over the past 2 years a total of 4,309 candidates (data for December 2012 has not been included) became eligible to possess DNB Qualification after clearing their theory and practical examinations. The maximum number of candidates passing in a single session was from December 2011 (1,934).

5. Over the past 2 years (data for December 2012 has not been included), maximum number of candidates has passed in Obstetrics and Gynecology (732) followed by Orthopedic, while the highest passing percentage was for Pathology (30.87%) followed by Ophthalmology (29.10%).

Acknowledgement

I owe a great many things to a great many people who helped me and supported me during the dissertation.

I wish to express my deep sense of gratitude to Prof. (Dr.) Bipin Batra, Executive Director, National Board of Examinations for giving me the opportunity to do my dissertation at National Board of Examinations. He was very kind enough to spare his valuable time and provide me suggestions regarding the study to be undertaken.

My special thanks to Dr. Anurag Agarwal, Additional Director and Dr. Vinay Gupta, Assistant Director, National Board of Examinations for their guidance, support, interest, involvement, encouragement and timely guidance during the training period.

My sincere acknowledgement goes to **Professor Indrajit Bhattacharya** for his kind assistance and support throughout my summer training.

Finally, I would like to show my greatest appreciation to my colleagues and family for their tremendous support and cooperation while working on this project.

The guidance and support received from all the members who contributed was vital for the success of the project. I am grateful to them for their constant support and guidance.

Thank You
Dr. Manish Jain (PT)
PGDHHM,
IIHMR, New Delhi

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Abbreviations

BI: Business Intelligence

DNB: Diplomate of National Board

NBE: National Board of Examinations

IA: Ideal Analytics

IMC: Indian Medical Council

NEET-PG: National Eligibility cum Entrance test for Post Graduate courses

BARC: Business Application Research Centre

KPI: Key Performance Indicators

SaaS: Software as as Service

Part I

Internship Report

1.1 Organization Profile

National Board of Examinations is an organization established by the Ministry of Health, Government of India in the field of Post Graduate Medical Education and Assessment.

NBE conducts examinations in 64 disciplines and subspecialties of modern medicine and has accredited 485 institutions/ hospitals in public and private sector all over the country for the purpose of training of candidates in various specialties in these disciplines.

The examinations conducted by NBE provide a common national benchmark for certification of training and post graduate skills. NBE's focus on quality and standards is reminiscent of excellence in education and assessment.

Government of India, after taking into account the expertise, experience and standing of NBE in the conduct of medical examinations entrusted the conduct of Screening Test for Foreign Medical Graduates Government has also notified National Board of Examinations for conducting the National Eligibility cum Entrance test for Post Graduate courses (NEET-PG) for gaining entry to MD/MS/PG Diploma courses under various universities/ institutions in the country. NBE has pioneered use of innovative tools for assessment in the country.

NBE grants accreditation for DNB courses to hospitals in various Broad and Super specialties and has laid down norms for recognition of hospitals/ institutions for residency based training.

National Board of Examinations in its continuous endeavor to undertake capacity building and strengthen the Post Graduate Medical Education in the country conducts Continuing Professional Development Workshops for the benefit of post graduate trainees, faculty and specialists/ consultants.

NBE maintains an interface with more than 150,000 medical graduates and over 2500 faculty members annually.

1.2 Area of Engagement

The area of engagement in the organization was in various departments and sections of National Board of Examination as a Research Associate. Initially I was engaged in the result and accreditation department. All the research work related to the result section was assigned to me. In accreditation section I was assigned the task of studying and analyzing the accreditation criteria for hospitals running DNB courses all over India. Based on the analysis we were assigned the responsibility of redesigning and modifying the accreditation inspection forms to enable better capturing of information and prevent any falsification of facts by the hospitals.

Later, I was also posted in the Academic Department where I was assigned work related to Specialty Advisory Boards of National Board of Examinations. I was also assigned the responsibility of a new programme being launched by National Board of Examinations where my role was communication with stakeholders involved in the programme and coordinating in preparation of accreditation criteria for the programme.

1.3 Managerial Tasks

Management is required for every small, big, developing organization who wants to be successful. Even the smallest tasks require a managerial skill to handle it otherwise all the pain may go to vain if not managed properly.

Some of the tasks that were performed are as follows:

- Research work related to result section

- Analysis of Foreign Medical Graduate Examination (FMGE) data and preparing reports on it
- Verification of DNB Final Exam Results for preparation of gold medal winners list in various specialties
- Operations & Communications: Revamping & operationalising the website of National Board of Examinations and organizing communication support
- Work related to Specialty Advisory Boards of National Board of Examinations
- Assisting the Specialty Advisory Boards members who are responsible for revision of course curriculum and guidelines
- Communication with the members of Specialty Advisory Boards and facilitate meetings between them
- Communication with stakeholders involved in a new programme being launched by National Board of Examinations and coordinating in preparation of accreditation criteria for the programme
- Redesigning and modifying the accreditation inspection forms for hospitals running DNB courses all over India
- Many other tasks apart from the above mentioned tasks were also assigned from time to time

1.4 Reflective Learning

As a Research Associate at National Board of Examinations I have gained valuable knowledge in terms of application of managerial and analysis skills in real practical world. It helped me to develop the skills and knowledge which are must everyone who wants to carve his/her career as successful professional.

Part II

Dissertation Report

on

Meaningful Analysis of profile of DNB Final Examination candidates using a Business Intelligence tool

Chapter 1: Introduction

Accessibility to healthcare services is extremely limited to many rural areas of the country. In addition, existing healthcare infrastructure is unplanned and is irregularly distributed. Further, there is a severe lack of trained doctors and nurses to service the needs of the large Indian populous.

While infrastructure improvement, capacity addition and development of manpower are critical for the Indian healthcare sector, it is also necessary that the existing facilities are operated in an efficient manner.

There is a need to identify and understand the trend in the rise of number of doctors possessing various qualifications, so that healthcare infrastructure planning can be done accordingly.

National Board of Examinations (NBE) at present conducts postgraduate and postdoctoral examinations in approved specialties leading to the award of Diplomate of National Board. Candidates registered with NBE as a DNB trainee or in possession of MD/MS in the concerned specialty can appear in the DNB Final Examination after completing their requisite training. NBE conducts examination in 64 specialties for both broad specialty and super specialty courses for which on an average 6000 candidates appear every year.

The Business Intelligence Tool (BI Tool) which shall be used for this analysis is Ideal Analytics. Ideal Analytics is a tool developed to facilitate analysis of data from different types of data sources like flat file system (.xls, .xlsx, .csv), databases, web services etc. The application is developing on SaaS architecture. Using this tool user can analyze the data on the ad hoc basis and can create different visualization and save the visualization for future and ongoing references.

Chapter 2: Problem Statement

This dissertation is based on using a Business Intelligence tool for meaningful analysis of DNB Final Examination candidates to extract more information and knowledge from the currently available data, enabling data analysis in a more meaningful manner.

2.1 Rationale of the study

This is a first attempt of utilization of a BI tool for meaningful analysis of data about candidates appearing in DNB Final Examination. This analysis will give us an overview about the recent trend regarding flow of medical practioners possessing DNB qualification all over India. The use of a BI tool in this analysis will help us to explore the data in much greater details and depth, providing us much more information and knowledge which is not possible otherwise.

Chapter 3: Review of Literature

The Nomenclature of the qualification awarded by the National Board of Examinations is "Diplomate of National Board". The recognized qualifications awarded by the Board in various Broad and Super specialties as approved by the Government of India and included in the First Schedule of IMC Act 1956 are:

- Diplomate National Board (Physiology)
- Diplomate National Board (General Medicine)
- Diplomate National Board (General Surgery)
- Diplomate National Board (Ophthalmology)
- Diplomate National Board (Anesthesiology)
- Diplomate National Board (Social and Preventive Medicine)
- Diplomate National Board (Psychiatry)
- Diplomate National Board (Paediatrics)
- Diplomate National Board (Orthopaedics)
- Diplomate National Board (Radio-diagnosis)
- Diplomate National Board (Radio Therapy)
- Diplomate National Board (Health Adminstration)
- Diplomate National Board (Oto-rhinolaryngology)
- Diplomate National Board (Dermatology & Venereology)
- Diplomate National Board (Obstetrics & Gynaecology)
- Diplomate National Board (Respiratory Diseases)
- Diplomate National Board (Neuro Surgery)
- Diplomate National Board (Pediatric Surgery)
- Diplomate National Board (Neurology)
- Diplomate National Board (Plastic Surgery)
- Diplomate National Board (Genito-Urinary Surgery)
- Diplomate National Board (Cardio-Thoracic Surgery)

- Diplomate National Board (Physical Medicine Rehabilitation)
- Diplomate National Board (Forensic Medicine)
- Diplomate National Board (Maternal Child Health)
- Diplomate National Board (Nephrology)
- Diplomate National Board (Cardiology)
- Diplomate National Board (Gastro-enterology)
- Diplomate National Board (Microbiology)
- Diplomate National Board (Family Medicine)
- Diplomate National Board (Pathology)
- Diplomate National Board (Biochemistry)
- Diplomate National Board (Nuclear Medicine)
- Diplomate National Board (Clinical Pharmacology and Therapeutics)

As per the Indian Medical Council Act 1956; the power to recognize medical qualification and determine their equivalence rests with central government. The Diplomate qualifications awarded by the National Board of Examinations are equated with the postgraduate and post doctorate degrees awarded by other Indian Universities for all purposes including appointment to teaching posts as lecture/Assistant Professor by the Government of India, Ministry of Health and Family Welfare; vide their notifications issued from time to time. The holders of Board's qualification awarded after an examination i.e. DNB are eligible to be considered for specialist's post/faculty in any Hospital including a training/teaching institution on a teaching post/ as faculty member. Diplomate National Board qualifications are well acknowledged globally.

DNB – Final is an exit examination leading to the award of DNB qualification. A candidate holding a medical qualification (MD/MS) i.e. having passed the final examination in a broad specialty recognized as per the provisions of Indian Medical Council Act 1956 as amended from time to time or a candidate registered with the Board as a DNB trainee and obtaining requisite period of training as prescribed by the Board & fulfilling other eligibility criteria may appear for the DNB final examination (Broad Specialty).

The DNB Final is a two-stage examination comprising of the theory and practical examination. An eligible candidate who has qualified the theory examination is permitted to appear in the practical examination. A candidate unsuccessful in the first attempt of practical examination is permitted to undertake two more attempt(s) in practical examination. These attempts shall be any two practical exams of the exams placed with the next three sessions of theory examination and after payment of full examination fees as may be prescribed by the Board.

Ideal-Analytics [IA] is a tool developed to facilitate analysis of data from different types of data sources like flat file system (.xls, .xlsx, .csv), databases, web services etc. The application is developing on SaaS architecture. Using this tool user can analysis data on the ad hoc basis and can create different visualization and save the visualization for future and ongoing references.

Except these main functionalities some other features of this application are:

- It can handle large data
- It has reporting capability
- It has an admin module where admin can administrate users and groups
- It has access control by which admin can restrict the functionality for a group of users

Ideal-Analytics [IA] can be defined as a suite of applications to collect, organize, store & analyze business data and provide access to users to help them in making better business decisions. Ideal-Analytics [IA]allows organizations to get a more accurate and detailed picture of what is going on in terms of business and customers through various analysis and reports e.g., accurate view of costs, liabilities, risks, customer buying patterns, supplier cost-effectiveness, etc. Ideal-Analytics [IA] can bring visibility into the organization at granular levels and help link different aspects together.

Chapter 4: Objectives

4.1 General Objective

To conduct a meaningful analysis of data about candidates appearing in DNB Final Examination.

4.2 Specific Objectives

- To find out the regional distribution of candidates appearing in DNB Final Examination.
- To find out the gender distribution of candidates appearing in DNB Final Examination.
- To find out the age wise distribution of candidates appearing in DNB Final Examination.
- To analyze the pattern of increase in number of medical practioners possessing DNB qualification all over the country.
- To predict the pattern of increase in number of medical practioners possessing DNB qualification in different specialties.

Chapter 5: Methodology

5.1 Study Design

Secondary/ Descriptive

5.2 Study Population

DNB Candidates for the year 2011 & 2012

5.3 Sampling

Purposive Sampling

5.4 Data

The data for this analysis was taken from the Final Examination section of NBE, from where data for the last 4 sessions, i.e. from June 2010 till December 2012 was collected.

The sessions for which the data was collected were:

- June 2011
- December 2011
- June 2012
- December 2012

The data which was taken from Final Examination section captured various aspects of information about the candidates taking DNB Final Examination like:

- Course being pursued- DNB Primary, DNB Diploma, MD/MS
- Specialty being pursued- 64 specialties
- Course joining and completion date

- Candidate demographic details like name, parents name, date of birth, gender, address, etc.

- Name of MBBS and DNB training institution

- Theory and Practical Examination results, i.e Pass/Fail/Absent/Withheld

- Other operational data of NBE was also present in the data available which was used for official purpose and operational work only and was not of relevance for the analysis.

5.5 Methods

For doing the meaningful analysis of the data, the excel sheet in .xls format was uploaded in the ideal analytic tool in the following steps:

Step 1 - Add & Save Connector

Figure 5.2.1: Adding & Saving a Connector

This step involves the uploading of the excel file and giving it a name

Step 2 – Data source Selection

Figure5.2.2: Selecting the data source

This step involves selecting out the exact excel sheet inside the excel file where the data is present and thereby giving a suitable name to it.

Step 3 – Adding the dataset

Figure 5.2.3: Adding the data set

1. Explorer
2. Show/Hide Explorer Button
3. Panel separator
4. Data-source selector
5. Dataset name
6. Raw data preview
7. Column selector
8. Column selection control
9. Column import control
10. Column visibility control
11. Auto-generated column ID
12. Alias name
13. Column names in raw data
14. Fact/Dimension selector
15. Data-type selector
16. Aggregation Operation
17. Filter selection control
18. Up/down control
19. Column removal button
20. Default Value Configuration
21. Drill-down manager
22. Customized column control
23. "Save" configuration button

This step involves defining the data sets i.e classifying the data sets, either in the form of dimensions or facts. To make it simple let's consider dimensions as the Y axis and facts as the X axis. Also filters can be applied to the data elements which one desires to be present in the final analysis

Step 4 – Loading the Dataset

After the dataset has been defined with the dimensions and the facts and filters have been assigned, the next step is to load the saved data set by a simple right click in the show explorer space. Once the dataset has been loaded, meaningful analysis is now possible

Step 5 Analysis
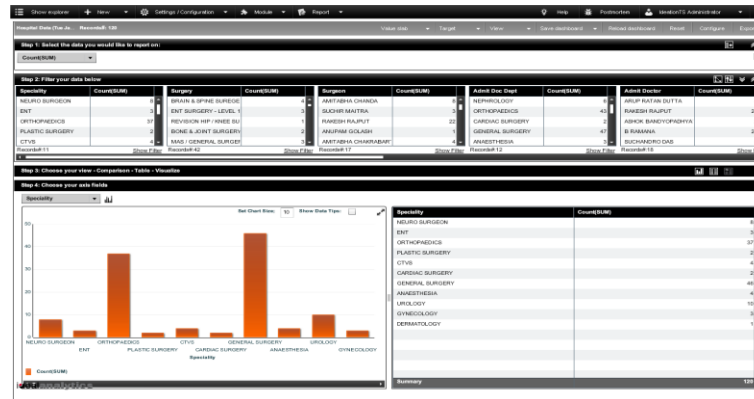
Figure 5.2.4: Dashboard for Analysis of Data

Step 6 – Create a Report

Once the meaningful analysis is done, the next step is to create a report. For this the create report tab allows one to save the analysis side by side and on a single click of 'Launch Report' the report gets generated which contains all the analysis which one has done with individual descriptions

Chapter 6: Results & Findings

The data was analysed on Ideal Analytics BI Tool and the following results and findings were obtained from it.

The data for sessions of June & December 2011 and June & December 2012 was analysed. Maximum number of candidates enrolled for DNB Final Examination was from the session of December 2011 followed by December 2012.

Session	Number of Candidates
June 2011	4128
December 2011	7178
June 2012	4445
December 2012	6456

Table 6.1: Session wise Candidates enrolled for DNB Final Examination
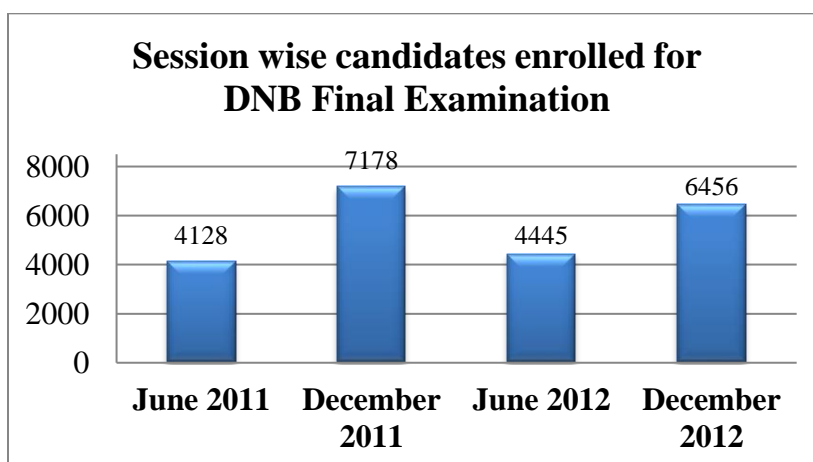
Figure 6.1: Session wise candidates enrolled for DNB Final Examination

Then for each session the number of candidates enrolled in different courses, i.e. DNB Primary, DNB Diploma, and MD/MS was analyzed to find out the number of candidates in each course.

In each session, maximum number of candidates were enrolled for DNB Primary except for December 2011 where maximum number of candidates were enrolled for DNB Diploma.

Session	DNB Primary	Diploma	MD/MS
June 2011	2621	1065	437
December 2011	2323	3429	1391
June 2012	2799	1053	593
December 2012	3779	1228	1448

Table 6.2: Course wise candidates enrolled for DNB Final Examination
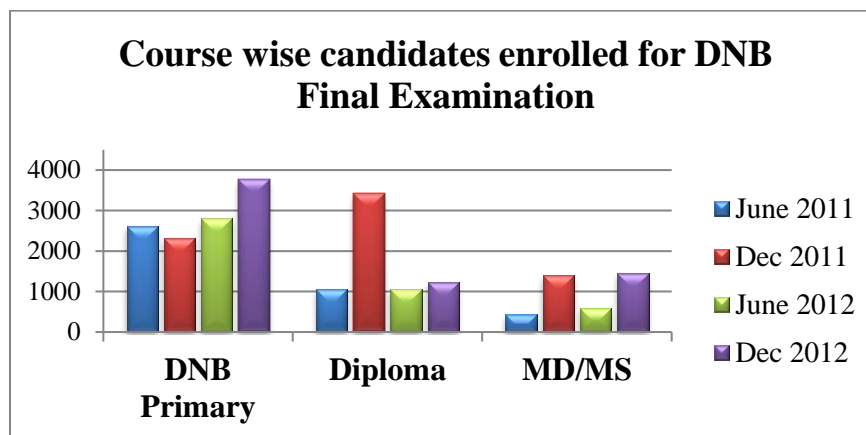
Figure 6.2: Course wise candidates enrolled for DNB Final Examination

Out of all the candidates appearing for DNB Final Examination an analysis was made that how many number of candidates were appearing for theory examination and how many candidates were appearing for only practical examination.

Session	Theory	Practical
June 2011	3507	612
December 2011	6021	1092
June 2012	3392	1043
December 2012	5270	1106

Table 6.3: Candidate Appearance for Examination
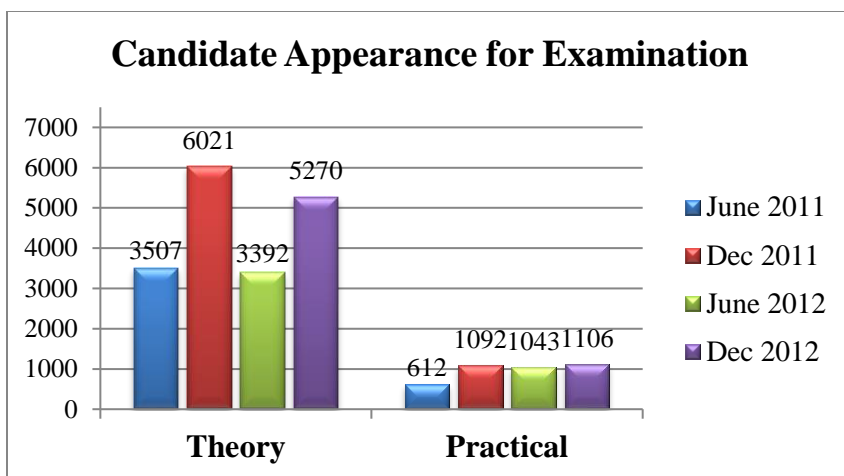
Figure 6.3: Candidate Appearance for Examination

A comparison of gender wise distribution of the candidates was made for each session. In each session out of the total candidates being enrolled for the examination 60% of them were male.

Session	Male	Female
June 2011	2493	1562
December 2011	4340	2561
June 2012	2721	1724
December 2012	4122	2333

Table 6.4: Gender wise Distribution
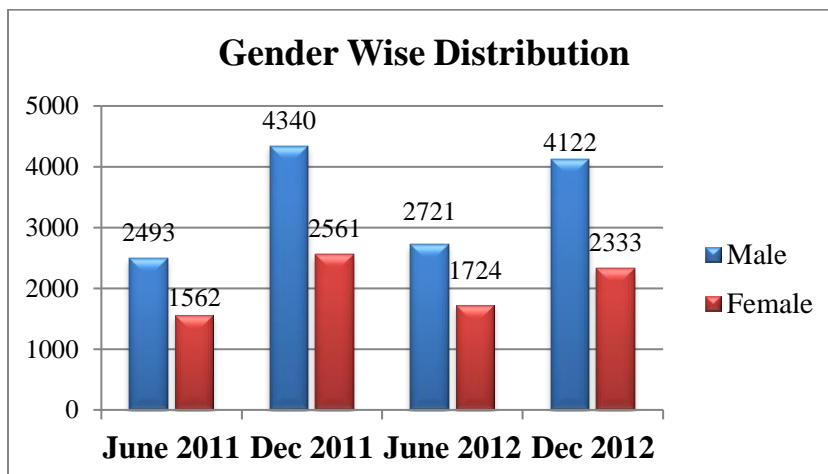
Figure 6.4: Gender wise Distribution

A comparison of age wise distribution of the candidates was made for each session. In all the sessions the maximum number of candidates enrolling for DNB Final Examination was of the age group 31-35, but in the session of December 2012, maximum number of candidates was from the age group 25-30.

Age Group	June 2011	December 2011	June 2012	December 2012
25-30	1328	2588	1449	3174
31-35	1866	2944	1887	2114
36-40	643	1099	740	776
41-45	167	343	236	257
45+	124	203	133	134

Table 6.5: Age wise Distribution
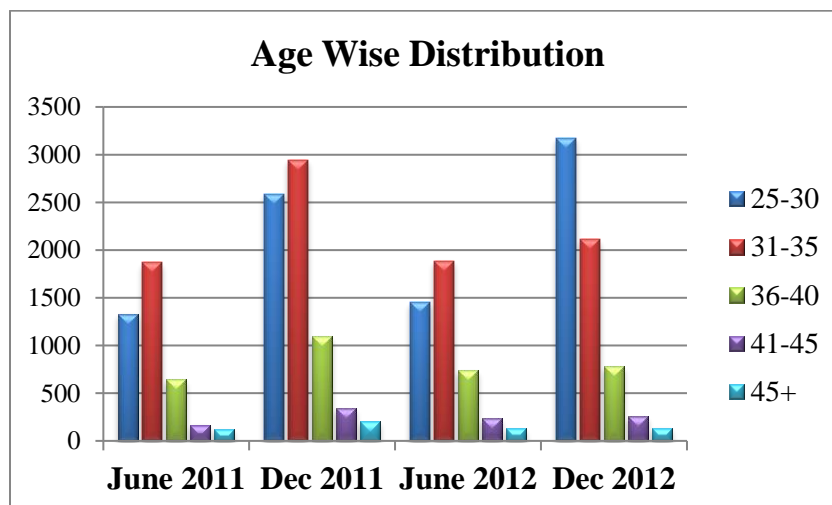
Figure 6.5: Age wise Distribution

An analysis of state wise distribution of candidates for each session was also done. Maximum numbers of candidates enrolled for DNB Final Examination were from Maharashtra, followed by Delhi, Tamil Nadu Karnataka and Kerala.

S. No.	State	June 2011	December 2011	June 2012	December 2012
1.	Andhra Pradesh	427	647	432	620
2.	Arunachal Pradesh		1		
3.	Assam	18	37	18	39
4.	Bihar	41	57	43	57
5.	Chandigarh	15	63	31	49
6.	Chhattisgarh	31	59	43	51
7.	Dadar & Nagar Haveli				1
8.	Delhi	375	880	525	844
9.	Goa	11	16	8	9
10.	Gujarat	47	118	77	130
11.	Haryana	102	177	121	191
12.	Himachal Pradesh	6	20	9	12
13.	Jammu & Kashmir	6	42	11	26
14.	Jharkhand	64	78	75	76
15.	Karnataka	463	755	443	702
16.	Kerala	375	756	409	569
17.	Madhya Pradesh	79	113	91	104
18.	Maharashtra	901	1446	1002	1355
19.	Manipur	1	3	6	6
20.	Meghalaya	6	9	8	9
21.	Nagaland	1	1	1	3
22.	Orissa	25	48	32	34
23.	Pondicherry	39	71	51	55
24.	Punjab	73	138	75	99
25.	Rajasthan	94	144	88	141
26.	Sikkim	1	2	2	4
27.	Tamil Nadu	465	825	428	649
28.	Tripura	3		1	2
29.	Uttar Pradesh	275	385	243	350
30.	Uttarakhand	5	21	10	23
31.	West Bengal	179	265	162	245

Table 6.6: State wise Distribution
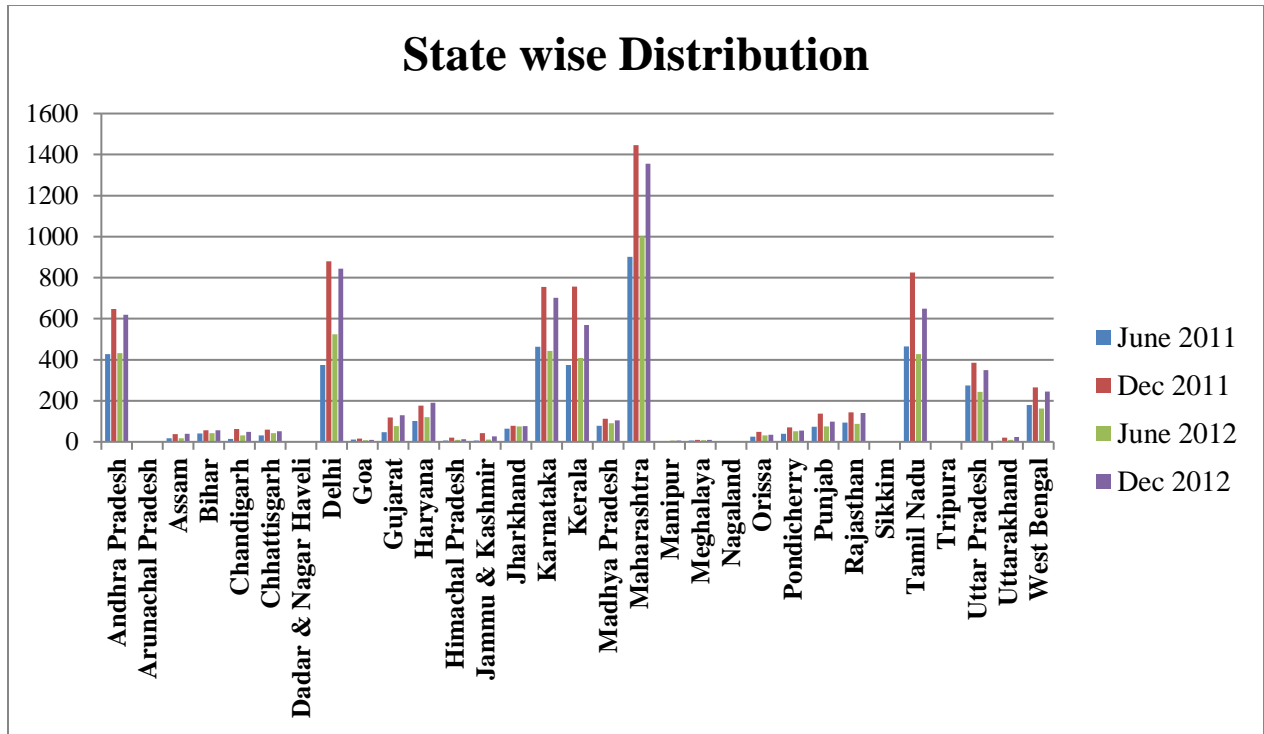
Figure 6.6: State wise Distribution

Now dividing the states into various zones a zonal distribution of the candidates was also done. Maximum numbers of candidates were from the South Zone, followed by West and North Zone.

S. No.	Zone	June 2011	December 2011	June 2012	December 2012
1.	North	857	1726	1025	1594
2.	East	309	448	312	412
3.	West	1053	1724	1175	1636
4.	South	1769	3054	1763	2595
5.	Central	110	172	134	155
6.	North East	30	53	36	63

Table 6.7: Zone wise Distribution
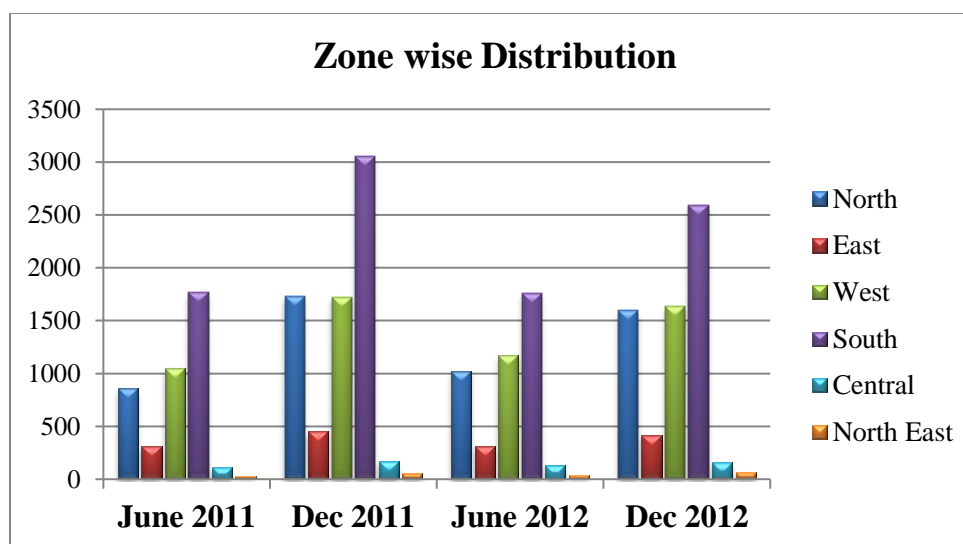
Figure 6.7: Zone wise Distribution

Then an analysis of subject wise candidate distribution was done to find out the number of candidates enrolled in each specialty.

Examinations for the following subjects were conducted in all the four sessions:

S. No.	Subject	June 2011	December 2011	June 2012	December 2012
1.	Anesthesiology	451	635	480	585
2.	Cardiology	147	112	67	99
3.	Family Medicine	177	235	153	150
4.	General Medicine	518	632	550	615
5.	General Surgery	373	529	397	487
6.	Obstetrics & Gynecology	733	814	695	761
7.	Ophthalmology	257	368	271	310
8.	Orthopaedics	535	648	526	637
9.	Paediatrics	546	729	607	663
10.	Radio Diagnosis	391	531	399	495

Table 6.8: Subject wise Distribution

Maximum numbers of candidates were enrolled for Obstetrics & Gynecology, followed by Orthopedics, Pediatrics, General Medicine and Anesthesiology.
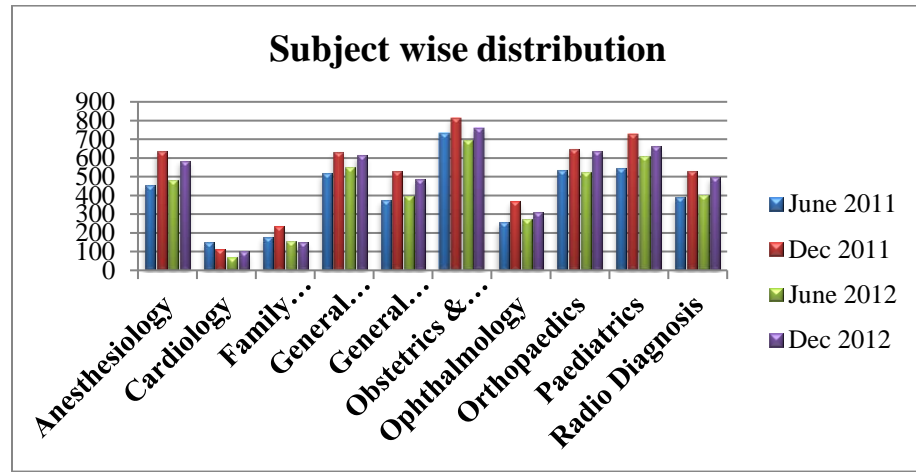
Figure 6.8: Subject wise Distribution

Examinations for the following subjects were not conducted in the session of June 2011:

S. No.	Subject	December 2011	June 2012	December 2012
1.	ENT	243	114	151
2.	Pathology	217	106	124
3.	Physiology	14	1	11
4.	Respiratory Disease	189	79	135

Table 6.9: Subject wise Distribution
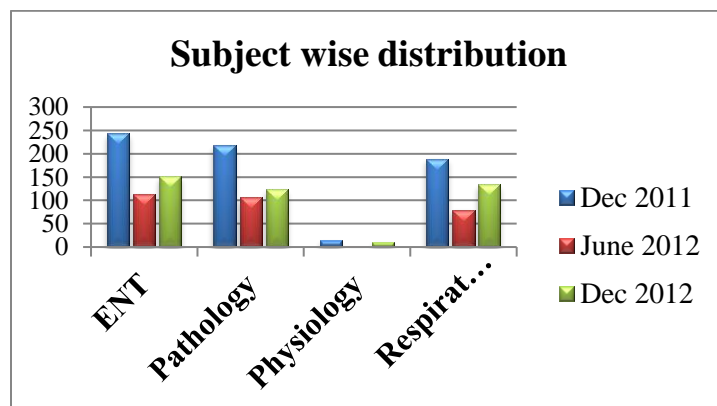
Figure 6.9: Subject wise Distribution

Examinations for the following subjects were conducted once a year, i.e. in the session of December:

S. No.	Subject	December 2011	December 2012
1.	Anatomy	20	13
2.	Biochemistry	11	12
3.	CTVS	32	68
4.	Dermatology &Venereology	172	140
5.	Endocrinology	24	16
6.	Field Epidemiology	0	15
7.	Forensic Medicine	5	7
8.	Gastroenterology	45	43
9.	GUS (Urology)	131	123
10.	Hematology	0	3
11.	Health Administration including Hospital Administration	12	12
12.	Immuno-Hemat & Transfusion Medicine	5	4
13.	Maternal and Child Health	3	3
14.	Medical Oncology	5	16
15.	Microbiology	28	37
16.	Neonatology	29	20
17.	Nephrology	70	52
18.	Neuro Surgery	121	129
19.	Neurology	27	24
20.	Nuclear Medicine	35	34
21.	Pediatric Surgery	30	28
22.	Peripheral Vascular Surgery	7	4
23.	Pharmacology	5	16
24.	PMR	23	15
25.	Plastic Surgery	56	52
26.	Psychiatry	125	124
27.	Radio Therapy	82	83
28.	Rheumatology	6	2
29.	Rural Surgery	15	10
30.	Social & Preventive Medicine	33	28
31.	Surgical Gastro	63	55
32.	Surgical Oncology	51	44

Table 6.10: Subject wise Distribution

Maximum numbers of candidates were enrolled for Dermatology &Venereology, followed by Urology, Neuro Surgery and Psychiatry.
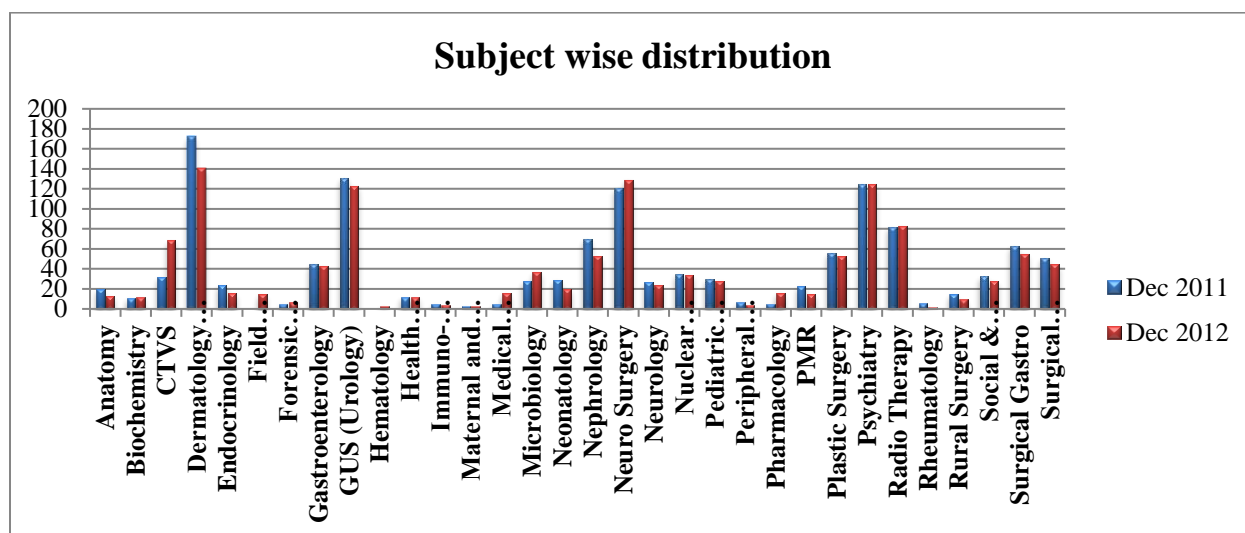
Figure 6.10: Subject wise Distribution

The result for all the 4 sessions was analyzed to see the number of passed candidates in theory examination. The result of the candidates was divided into 4 parts, i.e. Pass, Fail, Absent and Withheld.

The result of 1128 candidates for the session of December 2012 for 17 subjects is still awaited.

Maximum number of candidates passed in the session of December 2011 while December 2012 had the highest passing percentage of 60 %.

Result	June 2011	December 2011	June 2012	December 2012
Pass	2132	3490	2439	3202
Fail	1492	2506	1553	1388
Absent	443	908	404	588
Withheld	61	273	49	149

Table 6.11: Theory Examination Results
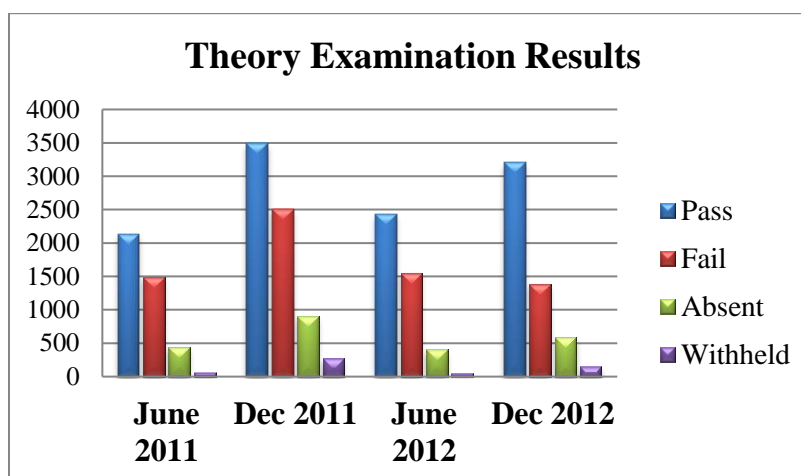
Figure 6.11: Theory Examination Results

The candidates who passed in their theory examination were then allowed to undertake practical examination. The result of the candidates was divided into 4 parts, i.e. Pass, Fail, Absent and Withheld.

The result for the session of December 2012 is not displayed as the practical examinations are to be conducted.

The session of December 2011 had the highest number of passing candidates and the highest passing percentage of 55 %.

Result	June 2011	December 2011	June 2012
Pass	1138	1934	1237
Fail	954	1427	1156
Absent	33	96	44
Withheld	7	34	2

Table 6.12: Practical Examination Results
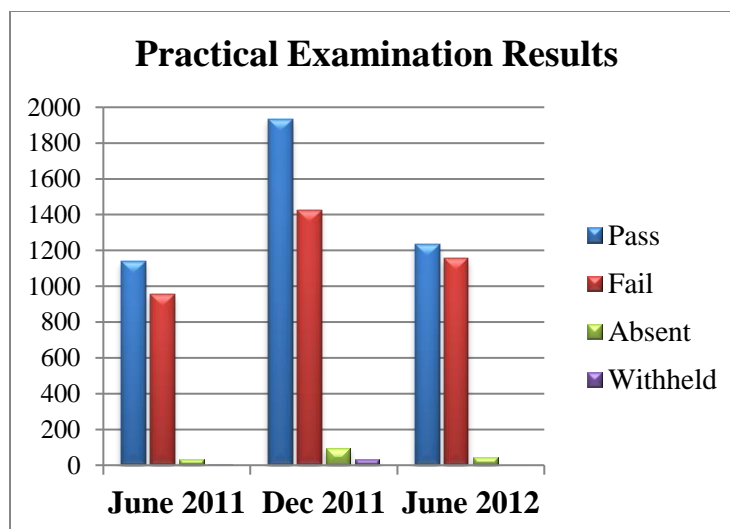
Figure 6.12: Practical Examination Results

Candidates who have passed both their theory and practical examinations are then awarded DNB certification by the Board. An analysis was done to find out the number of candidates in each specialty that has passed to see the pattern of increase in number of medical practioners possessing DNB qualification in different specialties over the last two years.

The maximum numbers of candidates possessing DNB qualification were from Obstetrics and Gynecology, followed by Orthopedics, Anesthesiology, General Medicine and Ophthalmology, while the highest passing percentage was for Pathology (30.87%) followed by Ophthalmology (29.10%).

S. No.	Subject	Total
1.	Obstetrics and Gynecology	732
2.	Orthopedics	484
3.	Anesthesiology	478
4.	General Medicine	367
5.	Ophthalmology	351
6.	Radio Diagnosis	326
7.	General Surgery	295
8.	Paediatrics	273
9.	Pathology	138

10.	Family Medicine	129
11.	Cardiology	120
12.	ENT	93
13.	Respiratory Disease	79

Table 6.13: Subject wise distribution for passing candidates

Specialty wise Distribution of passed candidates

Category	Value
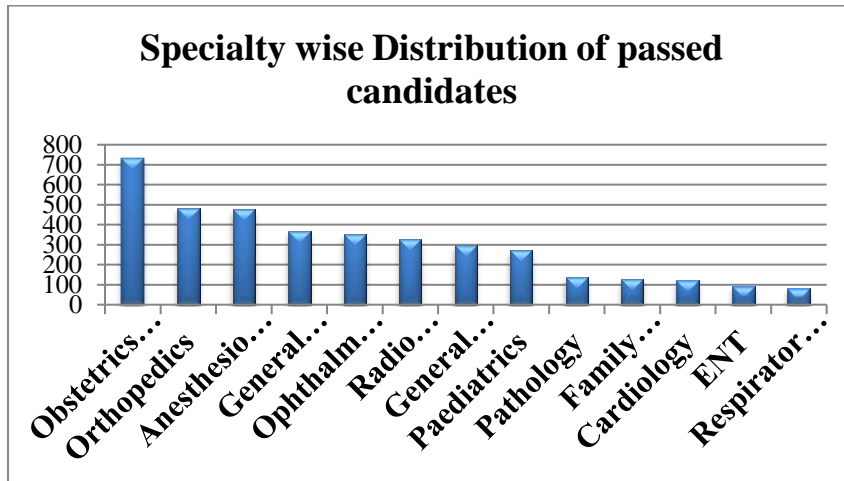
**Figure 6.13:** Subject wise distribution for passing candidates

Chapter 7: Discussion

7.1 Discussion

On analysis of the data the following findings were made which are discussed below.

- Maximum numbers of candidates enrolled for DNB Final Examination were from Maharashtra, followed by Delhi, Tamil Nadu Karnataka and Kerala.
- Maximum numbers of candidates were from the South Zone, followed by West and North Zone.
- In all the sessions the maximum number of candidates enrolling for DNB Final Examination were in the the age group 31-35, but in the session of December 2012, maximum number of candidates were from the age group 25-30.
- In each session out of the total candidates being enrolled for the examination 60% of them were male.
- During the last two years, maximum numbers of candidates possessing DNB qualification were from Obstetrics and Gynecology, followed by Orthopedics, Anesthesiology, General Medicine and Ophthalmology.
- Maximum number of candidates passed in the session on December 2011, i.e. 1.934 while June 2012 had the highest passing percentage of 27.8%.
- For Theory Examination results maximum number of candidates passed in the session of December 2011, i.e. 3,490 while December 2012 had the highest passing percentage of 60 %.
- For Practical Examination results maximum number of candidates passed in the session of December 2011 i.e. 1,934 having highest passing percentage of 55 % in all the sessions.

7.2 Limitations

- The data which was collected from the final section was entered through scanned forms and had errors like missing/blank entries.
- At various places wrong codes were assigned for various data entries.
- Uniformity in coding for the 4 sessions was not there. A particular set of codes was represented in different ways in different sessions.
- Data for other exams was not shared due to confidentiality issues

Chapter 8: Conclusion & Recommendations

From the above discussion we have seen that maximum number of candidates enrolling for DNB Final Examination is from Maharashtra, but other major populous states like Uttar Pradesh, Bihar, Rajasthan, and Madhya Pradesh have less number of candidates enrolling for DNB Final Examination. In such states, where the number of enrolled candidates does not match with the population, capacity building needs to be done for more number of DNB admissions.

Another area which came out quite prominently in the analysis was the low passing percentage of the candidates in the examination. The highest passing percentage among all the four sessions was 27.8% (1934 candidates) for December 2011. A careful monitoring and evaluation of the teaching programme needs to be carried out to understand and rectify this problem.

All the analysis of the data was carried out using a BI tool. Proper utilization of a BI tool in data analysis will help us to explore the data in much greater details and depth, providing us with much more information and knowledge which is not possible otherwise. It also helps in saving a lot of time which is being spent in analysis of data through conventional methods and practices.

The use of A BI tool will also help in identifying sources of errors in the data and make it easier for correction, which might get overlooked when using conventional methods and practices. Using a BI tool, we can analyze large volumes of data and predict the patterns and trends accurately. BI tool helps effectively measure, the key performance indicators which help in turn in effective decision making.

Part III

Case Study

on

**Comparative Analysis between
Cognos 10 and Tableau 7
Business Intelligence Tools**

3.1 Introduction

In the business intelligence (BI) marketplace, various BI tool vendors compete vigorously with each other. At first glance, it would seem that companies can use any of the BI tools to support their reporting and analysis needs. However, throughout the implementation and maintenance of BI applications, companies are realizing significant differences in the BI capabilities.

Organically grown architecture delivers superior performance, scalability, usability, efficiency, and reliability; all of which impact the total cost of ownership, user adoption, and ultimately the success of the BI project. As user and business requirements have become more complex, IT budgets nonetheless have come under increasing pressure. Organizations need to deliver BI solutions in light of expanding user requirements, increasing amounts of data, and differing data sources with a minimal amount of IT resources. Non-organic BI architectures require higher amounts of IT effort because of the basic nature of integrating disparate BI technologies which leads to redundant and repetitive administration and the constant development of one-off workarounds. In contrast, organically-developed BI architectures require the minimum amount of IT effort needed to deploy and maintain BI applications and can empower business people to create their own reports without reliance on IT personnel.

This case study discusses the key differences between two such BI tools, Cognos 10 and Tableau 7. For grading of both the BI tools a grading of 1-4 has been used, 1 being the lowest and 4 being the highest in comparison to other tools available in the market like MicroStrategy, Jasper, Deep Sea, etc.

3.2 Comparison of Cognos 10 and Tableau 7 on Key BI Capabilities

Business intelligence has the power to provide performance feedback and visibility to all people in an organization, thus enabling businesses to make better decisions every day. However, not all BI technologies deliver on this promise, falling short on a number of key capabilities demanded of enterprise BI applications. A complete and efficient BI platform must provide organizations with the following key capabilities:

1. **Delivering More BI with Less IT Effort**

Cognos report developers need to create redundant report metadata. Metadata they create cannot be reused across all reports, causing unnecessary maintenance. Cognos end users have limited self-service capabilities and are heavily dependent on IT, requiring more IT administrators and report developers. Tableau provides limited metadata reusability across the entire BI platform. As a result, it requires redundant development and maintenance efforts.

In a report published by Business Application Research Centre (BARC) in 2012, Tableau was ranked number one in all Key Performance Indicators (KPIs) relating to cost recording the lowest overall cost of ownership whereas Cognos was ranked number three.

2. **All User Needs through a Single Platform**

Cognos users must choose from stand alone "Studios" and platforms to access each style of BI, with disparate user interfaces and metadata. Tableau users are limited in the breadth of BI styles (no enterprise reporting, limited alerting and proactive notification, limited predictive analysis capabilities, etc.) that they can accomplish. Tableau users typically must recreate metadata with each report.

In the report of BARC, 2012 on all KPIs relating to user loyalty Tableau was ranked number one while Cognos was ranked number 13 showing the satisfaction level of the existing customers with the tool and their willingness to spend more money with the vendor.

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3. Enabling Goal Achievements

In the report of BARC, 2012 Tableau was rated very high in goal achievement with the score of 1.09 out of 1.10 while Cognos had a score of 0.83. In terms of business achievements, Cognos had a score of 0.82 while Tableau had a score of 1.11 out of 1.12.

4. High Performance at Any Scale

Tableau in comparison to Cognos supports a broad range of data types and allows end users to combine and analyze all relevant information within a company. This was also reflected in the BARC report of 2012, where Tableau achieved a score of 1.30 while Cognos had a score of 1.02.

5. Quick to Implement and Deploy, Easy to Maintain and Administer

Cognos follow on premise or client server deployment model. It provides disparate sets of source code that have been amalgamated through internal web services. Whereas Tableau follows a deployment model of on premise or client server and software as a service (SaaS). It is quick to implement because it does not require creating a metadata layer.

In the report of BARC, 2012 Tableau had the highest score for in house implementation by a very wide margin, and no Cognos was not even close to it.

6. Highly Interactive and Flexible Mobile Intelligence

Cognos does not have a well defined Mobile BI strategy and does not provide native applications for the iPhone or iPad, hence not providing Mobile Business Intelligence. Cognos Mobile is not a full mobile development platform, but merely another distribution channel for existing BI reports. Tableau on the other hand provides the feature of Mobile Business Intelligence on the iPad.

In the BARC report of 2012 Tableau had a score of 1.31 in terms of usability and flexibility while Cognos had a score of 0.74.

7. Deep Insight through Superior Analytics

Cognos provides analytical features like Ad Hoc Analysis, OLAP, Predictive Analysis and has a very user friendly Interface. Tableau apart from these also provides the analytical features of issue and trend indicators. In the report of BARC, 2012 Tableau has a score of 1.39 in the field of predictive analysis while Cognos had a score of 0.85.

In terms of reporting Cognos provides features like Adhoc Reporting, automatic schedule reporting, customizable dashboard & features, financial forecast and graphic benchmark tools. Whereas Tableau, apart from these provides feature of multiple language reporting and performance management but does not have customizable features and graphic benchmark tools which are present in Cognos.

Key Feature	Cognos	Tableau
Platform	• Windows • Linux/Unix	Windows
Deployment Model	On Premise/ Client Server	• On Premise/ Client Server • SaaS (Software as a Service)
Analytical Features	• Ad Hoc Analysis • OLAP • Predictive Analysis • User Friendly Interface	• Ad Hoc Analysis • OLAP • Predictive Analysis • User Friendly Interface • Issue Indicators • Trend Indicators
Reporting Features	• Ad Hoc Reporting • Automatic Scheduled Reporting • Customizable Dashboard • Customizable Features • Dashboard	• Ad Hoc Reporting • Automatic Scheduled Reporting • Customizable Dashboard • Dashboard • Financial Forecast/Budget

	• Financial Forecast/Budget • Graphic Benchmark Tools	• Multiple Languages • Performance Measurements
Mobile Capability	None	Mobile BI
Support Features	• Email • In Person Training • Phone	• Email • Online Chat • Phone • Tutorials

Table 1: Comparison between Cognos and Tableau

A comparison of Cognos vs. Tableau according to Capterra

Key Feature	Cognos	Tableau
Description	Cognos provides a cohesive Performance Management and Business Intelligence solution, with budgeting, strategic planning, forecasting, and consolidations - across financial, operational, sales and marketing, and human resources departments.	Visual analysis software gives the power to rapidly transform data into smart, visual analytics via a drag-&-drop interface. Reads databases where they are.
Platform	• Windows • Linux/Unix	Windows
Company Size Served	Users Supported: 1 - 1000+	Users Supported: 1 - 1000+
	Number of Employees:1-1000+	Number of Employees:1-1000+
Locations Served	United States Canada Latin America United Kingdom Europe Africa Asia Australia	United States Canada Latin America United Kingdom Europe Africa Asia Australia
Features		
Ad Hoc Analysis	✓	✓
Ad Hoc Query		✓
Ad Hoc Reporting	✓	✓
Benchmarking	✓	✓
Budgeting & Forecasting	✓	✓
Compliance Management		✓

Feature	Cognos	Tableau
Custom User Interface	✓	✓
Customizable Fields	✓	✓
Customizable Functionality	✓	✓
Customizable Reporting	✓	✓
Dashboard	✓	✓
Data Import/Export	✓	✓
Data Management		✓
Graphical Data Presentation	✓	✓
KPI	✓	✓
Legacy System Integration		✓
Multilanguage		✓
OLAP	✓	✓
Performance Metrics		✓
Predictive Analysis	✓	✓
Profitability Analysis		✓
Reporting	✓	✓
Strategic Planning	✓	✓
Trend/ Problem Indicators		✓
Work Flow Management	✓	✓

Table 2: Capterra Comparison between Cognos and Tableau

3.3 Conclusion

On analyzing, the above KPIs it was found that Tableau is highly recommended for supporting customer requirements and leads over Cognos in terms of functional scope and user recommendations. Tableau has great advantage over Cognos in the support of workflows and collaboration between users.

When analyzed over the above discussed key capabilities, it was found that Tableau hold an advantage over Cognos in the ability to deliver BI to more users and a great amount of data with fewer IT staff. To save costs and ensure successful BI solutions, decision makers must evaluate the key BI capabilities that reduce IT efforts and make the BI platform easier to implement, deploy, maintain, and administer.

In today's world self service has become one of the most important areas for BI vendors as companies are striving for more agile environment and need technology that supports self service approach. In this area also Tableau holds an advantage over Cognos.

In terms of implementation and deployment, ease of maintenance and administration Tableau is way ahead of Cognos providing a unified architecture, easier deployment & administration and smoother customization & migration. In terms of flexibility and analytical features provision also, Tableau has an advantage over Cognos with its mobile BI application and added analytical and reporting features.

Overall we can say that Tableau has an advantage over Cognos in overall aspects of KPIs and is a better BI tool in terms of usability, flexibility, user satisfaction & recommendations and advanced analytical & reporting features.

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