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## Effectiveness of The Financial Inclusion Programme: A Case Study of Syndicate Bank

NAGARAJA

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**KEYWORDS:****Introduction:**

Financial inclusion has become one of the most critical aspects in the context of inclusive growth and sustainable development in the developing countries like India (Verma and Singh, 2014). Even after 60 years of independence, a large section of Indian population still remains unbanked. In India out of 19.9 Crore households, only 6.82 crore households, have access to banking services. As far as rural areas are concerned, out of 13.8 crore households in India, only 4.86 crore households have access to banking services. In urban areas only 48.52% of households have access to banking services. Over 41% of adult people in India do not have bank account (Madurai, 2011). This malaise has led generation of financial instability and pauperism among the lower income group who do not have access to financial products and services (Bhandawat, 2013). However, in the recent years several steps have been taken by the Reserve Bank of India and the Government to bring the financially excluded people to the fold of the formal banking services. The 100 per cent financial inclusion drive is progressing all over the country (Madurai, 2011). Against this background, an attempt has been made to study the effectiveness of the financial inclusion programme at a micro level.

**Objectives of the study:**

The objective of the present study is to highlight the effectiveness of the financial inclusion programme at a micro level, that is, at the branch level of a nationalised bank.

**Review of literature:**

Thapar (2013) says more than 50% of the bank branches in Punjab have started implementing the program in areas with population of at least 2000. But still more effort is needed to open more branches within rural areas to provide access of banking services within these areas and for having 100% financial inclusion. Sharma and Kukreja (2013) suggest in their article that mere opening of no-frill bank accounts is not the purpose or the end of financial inclusion while formal financing institutions must gain the trust and goodwill of the poor through developing strong linkages with community-based financial ventures and cooperatives. Financial inclusion has not yielded the desired results and there is long road ahead but no doubt it is playing a significant role and is working on the positive side. Paramasivan and Kumar (2013) mention that the branch density has a significant impact on financial inclusion. The branch density in a state measures the opportunity for financial inclusion in India. Literacy is a prerequisite for creating investment awareness, and hence it seems to be a key tool for financial inclusion. But, literacy alone cannot guarantee high level financial inclusion in a state. It is not possible to achieve financial inclusion only by creating investment awareness, without significantly improving the investment opportunities in India. Unnikrishnan (2012) analyses the barriers to effective financial inclusion and the measures to be taken to overcome the barriers and enable inclusive growth. The study concluded by identifying the variables that helps the people financially and stating the importance of social inclusion in relation to financial inclusion. In this context, an attempt has been made to study the effectiveness of the financial inclusion programme at a micro level by choosing a particular branch of Syndicate bank.

**Research Methodology:**

The study mainly depended upon the primary data. However, some

secondary sources of data were also consulted for the purpose of gathering background information supporting the study. Relevant primary data was collected from the manager and officers of the Kallianpur branch of nationalised Syndicate bank personally. The State of Karnataka, particularly the region comprising the coastal districts of Dakshina Kannada and Udupi is called as the cradle of banking in India (Sharma, 2005). Four well-known nationalised banks originated in these coastal districts, and interestingly, Syndicate bank was established in the Mooduthonse (Kallianpur) village of Udupi district and Syndicate bank is the lead bank for the Udupi district. These two coastal districts have one among the best distribution of banks in India - a branch for every 500 persons (Sharma, 2003). That is why, the researcher has considered the present branch as the best sample for this case study. The relevant primary data was also collected from the Panchayat Development Officer (PDO) and the Panchayat secretary for the purpose of this study.

**Results and Discussion**

The schemes like Pradhan Mantri Jan Dhan Yojana (PMJDY), Pradhan Mantri Ujjwala Yojana (PMUY), Pradhan Mantri Jan Suraksha Yojana (PMJSY) and Atal Pension Yojana (APY) have been a great success in Syndicate Bank. Syndicate bank has covered all the villages and has made every possible effort to make sure that all households coming under its fold, open the bank accounts through the support of their Business Correspondents (BCs) and the local Panchayath. Syndicate bank has clearly surpassed the target under the unbanked village coverage scheme for the financial year 2013-14 by covering 1787 villages as against the target of 850 villages. The bank has surpassed the annual target under the saving bank deposit account opening in unbanked villages. It has surpassed the target for the appointment of Business Correspondents (BCs) as on 31.03.2014 by appointing 1948 BCs as against the target of 1920 BCs and the target for opening Rural branches by opening 131 rural branches against the target of 75 branches. These measures have clearly show that the syndicate bank has taken serious measures to bring unbanked people under banking services. The officers at Kallianpur branch have visited all the schools and colleges around Kallianpur to open students' accounts.

**Financial Inclusion in Kallianpur Branch: Pradhan Mantri Jan Dhan Yojana (PMJDY):**

Prime Minister Sri Narendra Modi launched the national mission on financial inclusion named as Pradhan Mantri Jan Dhan Yojana (PMJDY) on 28<sup>th</sup> August 2014. The PMJDY shall provide a basic bank account to every family, which till now, has no bank account. It is a no frill account, which can be opened by producing the minimum KYC details with photo. This scheme aims to provide security to those families who cannot afford direct insurance. In Kallianpur village, 3138 Jan Dhan accounts have been opened in syndicate bank branch as on 31<sup>st</sup> October 2015 but 1800 accounts show zero balance to their credit and the bank has sent intimation to all those having zero balance in their Jan Dhan accounts, but many of intimations get returned to the bank because of incorrect address given by them. Many people have opened their bank account under this Yojana with the presumption that all will get Rs.5000 overdraft. Because of financial illiteracy they have blindly opened their bank account and they are not at all operating their accounts. There are a few people in this village they still do not have bank accounts. The branch and Panchayat have not undertaken any programme to attract those unbanked people. Even though it was clearly mentioned in the guidelines of this Yojana that a person already having bank account need not open one more account, many



of the existing customers have opened these accounts resulting in holding of multiple accounts by these individuals. 3138 accounts are opened in this branch during JhanDhan campaign and it was difficult for the bank to deliver the passbook and Rupay Cards. People had wrong assumption that everybody will get overdraft facility without interest but when they came to know the facts many did not turn up to collect passbook and Rupay card. Even though the passbook and card have been delivered to customers, the operations in these accounts are not satisfactory. In fact, many have not yet started operating these accounts at all.

#### **PradhanMantriJeevanJyothiYojana (PMJJY):**

This scheme offers a life insurance cover of Rs. 2,00,000 for death due to any reason payable to the nominee on death of insured, for a single premium of Rs. 330 per annum. The scheme is valid for one year cover and it is renewable from year to year. All the savings bank account holders, in the age group of 18 to 50 years are entitled to join this scheme. Risk in Kallianpur branch 190 account holders (100 Male and 90 Female) are the beneficiaries of this scheme as on 30 November 2015.

#### **PradhanMantriJeevanSurakshaYojana(PMJSY):**

This is an accident insurance scheme offering accidental death and disability cover for death or disability on account of accident. Risk coverage amount is Rs. 200000 on death, Rs. 200000 on irrecoverable loss of both eyes or loss of use of both hands or feet or loss of sight of one eye or loss of use of one hand or foot. The scheme is valid for one year cover and it is renewable from year to year. Premium payable is Rs. 12 per member which will be deducted from savings bank account on the 1<sup>st</sup> of June every year. 2.80% of the total account holders of the Kallianpur branch are participating in this scheme (481 accounts – 208 Male and 273 Female) as on 30 November 2015.

#### **Atal Pension Yojana(APY):**

The government of India is concerned about the old age income security of the working poor and is focused on encouraging and enabling them to save for their retirement. To address this risk among the workers in the unorganised sector and to encourage them to voluntarily save for retirement, the government has announced a new scheme called Atal Pension Yojana in the budget for the year 2015-16. Under this scheme, there is a guaranteed minimum monthly pension for the subscriber ranging between Rs 1000 to Rs 5000 per month. The benefit of minimum pension is guaranteed by the government. The government also contributes 50% of subscriber contribution or Rs. 1000 per annum, whichever is lower. All the citizens of India aged between 18-40 years are eligible for APY scheme. Unfortunately, only 12 people (less than 0.10 % of the total account holders) are using this Yojana in Kallianpur branch. It shows the labour class account holders are not in this scheme, and many are labour class account holders they are less bothered about pension and even the bank has not undertaken any measures to attract the people.

#### **Prime Minister Mudra Yojana:**

Micro Unit Development and Refinancing Agency Ltd (MUDRA) has been opened with the objects of 'finding the unfunded' and 'formalizing the informal'. MUDRA aims at providing finance / refinancing to last mile financial institutions like commercial banks/RRB/ Co-operative banks, etc. which are in the business of financing micro enterprises in manufacturing, trading and services sectors in rural and urban areas. As per this scheme, the eligible banks can avail refinancing for loans given to micro units disbursed on or after 08/04/2015 upto Rs. 10 lakhs per unit from MUDRA. Non-farm enterprises in manufacturing, trading and service sectors whose credit needs are below Rs. 10 lakhs and given to income generating activities will be known as Mudra loans. Upto Rs. 50,000/- loan amount is classified as "Shishu", Rs. 50,001 to Rs 5 lakhs loans termed as "Kishore" and from Rs 5 lakhs to 10 lakhs loans are classified as "Tarun". Only 12 people are beneficiaries of this scheme as on 30 Nov 2015 in the Kallianpur branch.

#### **SHG and JLG:**

Self Help Group are believed to be most effective tool for delivering credit and are often considered as an alternative loan delivery system with minimal defaults. This scheme is effective for delivering the credit particularly to rural for their economic and social development. Joint Village Groups are informal group comprising 4 to 10 individuals working together for the purpose of availing credit.

GIRA - GIRA

gle or through group mechanism against mutual guarantee. Usually the members of JLG would engage in a similar type of activity in the Agriculture and Allied sector. The members enter into a joint undertaking to the bank that enables them to avail credit for occupational and social activities. In Kallianpur, only 8 members are expected to provide support to each other and actively involving in banking activities they are taking joint repaying through instalments.

#### **Summary of the Research Findings:**

##### **Here is a brief summary of the research findings:**

Self-employed people are making the use of banking services generating their accounts frequently compared to labour class. Approximately 230 business accounts are there in this branch.

Branch has maximum number of customers in the middle class category. So, there is significant potential for expanding banking and having more deposits as middle class people tend to save for their future.

The branch has opened 5,463 no frills accounts of their customers. It is not very effective for the coverage of more population under financial inclusion programme because of RBI's conditions.

The major challenge faced by the branch is lack of awareness among the potential customers and also lack of ability of the customers to produce their identity proof with the bank branch.

Customers are preferably using ATM facilities (10,700 holders), mobile banking (1,200 account holders) and credit card (36 account holders) for making payments as it is more convenient for them.

The branch bankers feel that the financial inclusion programme has not reduced the dependence of money lenders by the people to some extent.

#### **Suggestions:**

The researcher would like to make the following suggestions for enhancing the financial inclusion program at the branch level.

The bank should do regular surveys in villages for understanding the financial needs of the people.

Bank should collect feedback from its customers about their services.

Telecom service providers and bank should work together to improve mobile banking services which should be encouraged.

The government should make it binding for the local authority to the bank to conduct some awareness programme in their locality.

NGOs and social organisations should, in collaboration with bank and local government, conduct street plays in rural areas to create awareness.

#### **Conclusion:**

The study concludes that the Syndicate bank is meeting the guidelines of the RBI for opening branches in areas with population above 2,000 by offering no frills account and by simplifying KYC norms, but still a lot is desired to be done to achieve progress in the financial inclusion programme. Bank needs to create more awareness about banking services among rural people. The local panchayat too, has to effectively join hands to achieve complete financial inclusion. Financial inclusion may be a social responsibility in the short run but it will turn out to be a huge business opportunity in the long run. Financial inclusion of the unbanked masses is expected to unleash the huge untapped potential of the bottom of pyramid section of Indian economy. Perhaps, financial inclusion can begin the next revolution of growth and prosperity in our country.

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## Diaspora and Literary Conflicts

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Colonialism has given rise to myriad experiences. Diasporic experience is one among them. For many reasons one becomes diasporic. If during the colonial period the political situation was the reason for the diasporic movement, in the postcolonial period globalization forced many to move to different parts of the world. Some moved for security reasons, while some others moved for economic reasons. Robert J. C. Young opines that, "postcolonialism is about changing world," (2002: 7). Taking this cue from Young, Usha Bande says; "this changing world is brought about by migration, multiculturalism and globalization that have become the defining paradigm for diasporas" (2008: 22). Concomitantly, all the recent diasporas with certain exceptions, are voluntary and whatever literature that has been produced through the diasporic experience is "the product of shared culture and shared history" (22).

'Diaspora' is a term which is being discussed aloud in the postcolonial and postmodern context. When one moves from his/her country to another country for the reasons known, he/she cuts off the physical strings from the native. But psychologically he/she is still a part of the original place. This gives rise to a sense of physical as well as psychological dispossessions and nostalgia. It is not easy for the person from the diaspora to easily get accustomed to the foreign culture and norms. He / She always feels insecure with a sense of discontinuity between two places which could also have some resistance towards the immigrated country and its culture. As a proof to this Bande records; "..., in the diasporic experience neither the acceptance of the hyphenated existence nor the disengagement from 'home' with a decision to move forward without looking back is as simple as theorization; it has acute psychological dynamics and endless possibilities." (28).

Diasporic experience is enlivened with history, memory and nostalgia. And this experience will give rise to critical thinking along with cultural experiences. For a creative writer this experience forms a base for the creative literature and the conflicts, as many of the Indian writers in English have proved. Gita Mehta, Rohinton Mistry and Salman Rushdie are a few among them. This paper will concentrate on the literary conflicts faced by Gita Mehta and Rohinton Mistry as diasporic writers.

  
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Gita Mehta began her career as a journalist, working in the print and visual media. She directed a few documentaries for the television before she embarked on a career as a novelist. She is a writer from the diaspora. Theoretically, women experience diaspora under three conditions – first, when they grow up in a foreign land with their migrant parents; secondly, by virtue of their marriage when they are uprooted from their parental home and then from their homeland; and thirdly, when they exercise their concise choice to go to some western metropolitan centre in pursuance of their ambition, higher education or some lucrative job. Whatever be the broad categorization, in real-life experience, they are caught between the psychological problems of diaspora, such as dislocation, unbelonging, marginalization, and cultural dissonance that are common also to men, and a variety of oppressive conditions and discriminatory practices peculiar to the gender, both inside and outside the community (Vidhya, 2012: 1). Gita Mehta has experienced all these diasporic attitudes.

Diasporic writers have a double task to perform in their writings. They have to represent both, their living place and their 'home'. This is the challenging literary conflict a diasporic writer can face. Gita Mehta, quite aware of this challenge, tries to strike a balance between the two. If East is her home, West is the place where she lives. In her writings, she shows how a diasporic writer can negotiate between the cultural values of both the ends. From politics to spirituality and from saints and to dupes, she takes a distinct stand of her own treating the issues in the post-colonial background. In one of her interviews, she claims that her association with her homeland, where she still spends almost three months vacationing, helps her to rejuvenate the culture she is very much attached to. There is an interesting comment on the cover page of the book *Gita Mehta: Writing Home / Creating Homeland*, which reads:

To Gita, India is "home". Home stands for a safe place, where there is no need to justify oneself to others, but as a member of the diaspora she ought to redefine her position. That she should feel the need to explicate and explain herself and her culture to the west is in itself an acknowledgement of cultural differences felt by the diasporic consciousness. Though she looks at her country with the bemused gaze of an outsider, her strong urge to recover the lost essence and to return to the folds of her culture become explicitly obvious. Her works are set in India but they move in and out of the two cultures, blending subjective experience with observations and imagination to recreate India that was and India that is. (Inner cover page).

This is exactly what Gita Mehta does in her fiction and non-fiction. She does not seem to brush over what she has to speak about 'eastern mysticism' or 'western materialism.' Instead, she



## "Perceptions of Indian Youth towards Digital India Initiatives"

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**Abstract** - The major purpose of this study is to examine the perceptions of the Indian youth towards the Digital India Initiatives of the Government of India. Specifically, the study makes an attempt to determine the level of agreement of the Indian youth, aged between 18 and 21, on the 18 statements qualifying as variables which are based on the three vision areas of Digital India Initiatives. The primary data has been collected using a structured questionnaire administered to 250 respondents, randomly selected from the Udupi district. The results of the study show that the respondents have a positive level of agreement with 17 of the 18 variables. The extreme levels of agreement are on two of the variables, one being the 'Mobile phone and bank account enable participation in digital and financial space', the level of agreement is with a percentage mean of 91.55, which indicates that they 'strongly agree' with the variable, and the other one being, 'Digital Infrastructure ensures safe and secure cyber space', the level of agreement is with a percentage mean of 54.26, which indicates that they are 'not sure' of the variable.

**Key Words:** Perceptions, Indian, Youth, Digital India.

### I. INTRODUCTION

Digital India is a campaign launched by the Government of India to ensure that Government services are made available to citizens electronically by improved online infrastructure and by increasing internet connectivity or by making the country digitally empowered in the field of technology [1]. Digital India was launched by the Prime Minister of India, Mr. Narendra Modi on 1 July 2015, with an objective of connecting rural areas with high-speed internet networks and improving digital literacy [2][3][4]. The vision of Digital India programme is inclusive growth in areas of electronic services, products, manufacturing and job opportunities, etc. and it is centered on three key areas - Digital Infrastructure as a Utility to Every Citizen, Governance & Services on Demand and Digital Empowerment of Citizens [5]. This paper tries to examine the perceptions of Indian youth towards the Digital India initiatives of the Government of India. Specifically, the study makes an attempt to determine the level of agreement of the Indian youth towards the 18 statements qualifying as variables which are based on the three vision areas of Digital India initiatives.

### II. OBJECTIVE OF THE STUDY

The objective of this paper is to study and analyze the perceptions of the Indian youth towards Digital India initiatives of the Government of India.

### III. REVIEW OF THE LITERATURE

Although India has been successful in the field of IT and ITeS, a comprehensive Digital India concept is comparatively a new concept. Hence, much of the published material in the field of Digital India reproduces whatever is stated in the official government website on Digital India. Of course, a few general articles speak about the opportunities and challenges of Digital India initiatives. However, there has been no academic research in this area. There have been many research studies in the field of digital library resources and the researchers report that the studies have revealed the following: (i) high level of awareness and utilization of digital library services by the respondents, (ii) positive attitude towards the digital library services, (iii) satisfaction with current digital library features and functionality, and (iv) academic work would suffer without digital resource [6] [7] [8] [9] [10]. These studies, although comprise a small fraction of Digital India, show that the youth are positive about any service that is in the digital or e-form. Against this background, the present study titled "Perceptions of Indian youth towards Digital India Initiatives" assumes significance.

### IV. RESEARCH METHODOLOGY

The study mainly depended upon the primary data. However, some secondary sources of data were also consulted for the purpose of gathering background information supporting the study. Relevant primary data was collected using a structured questionnaire administered to 250 respondents, aged between 18 and 21, randomly selected from the Udupi district. The perceptions of the respondents on the 18 statements, qualifying as the variables, which are based on the three vision areas of digital India initiatives, derived from a review of literature in the area of study, are measured on Likert's (1932) five-point scale of 'strongly disagree..... strongly agree', the scale in quantitative terms being: 0 - 20 per cent: strongly disagree, 21 - 40 per cent: disagree, 41 - 60 per cent: not sure, 61 - 80 per cent: agree, 81 - 100 per cent:



## MAPPING OF LEADERSHIP COMPETENCY OF HR PROFESSIONALS EMPLOYED IN ITES / BPO COMPANIES IN BANGALORE CITY

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### ABSTRACT

ITES / BPO Companies have high potential of employment for the youth with all sorts of educational qualifications. As a subsidy of Information Technology industry, ITES / BPO Companies generate high revenue and contribute much to the economy of the country. Achievement of organizational goals and targets in these companies depend very much on the competency of the employees working in these organizations. The competencies that are once needed for the HR professionals became insufficient to face the present day HR challenges, hence, there is a need to map competencies. According to the HR literature, Competency has many dimensions such as Leadership competencies (LC), Interpersonal competencies (IC), Business competencies (BC), Technical competencies (TC), Analytical competencies (AC), Technological competencies (TGC). The present study focuses on mapping the leadership competency of the HR Professionals employed in ITES/BPO companies

in Bangalore city. The study revealed that the present level of leadership competency respondents is 71.4% and a competency gap of 28.6%. Association between the level of leadership competency and various socio economic factors of the respondents have been analyzed in the study.

**Key Words:** Competency Mapping, HR Professionals, HR Challenges, Leadership Competency

### INTRODUCTION

ITES / BPO companies operate on voice and non-voice work processes. They are increasing in number from time to time. There is a huge human resources requirement. These companies face many HR Challenges also in globalization environment. Welbourne and Cyr (1999) have highlighted the role of HR professionals as an important determinant of organizational performance. Business Process Outsourcing (BPO) is the delegation of one or more IT-intensive business processes to an external provider that in turn owns administers and manages the selected process based on defined and measurable performance criteria. Business Process Outsourcing (BPO) is one of the fastest growing segments of the Information Technology Enabled Services (ITES) industry. Competency mapping is a process to identify and describe competencies that are the most critical to success in a work situation or work role. Competency mapping is a strategic HR framework for monitoring the performance and development of human resource in organizations.

### COMPETENCY MAPPING

Competency Mapping is processes of identifying key competencies for an organization and/or a job and incorporating those competencies throughout the various processes (i.e. job evaluation, training, recruitment) of the organization. It examines strengths of the individual in areas like team structure, leadership, and decision-making.

Boyatzis (1982) defined competency as 'an underlying characteristic of a person which



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### Poverty and Inclusive Development A Step towards Swaraj from Billionnaire Raj

Reshma K\*

#### Introduction

In India, poverty is measured in terms of household per capita consumption expenditure. Poverty lines, determined by the government for each Indian state are updated regularly. The latest poverty lines are based on the recommendations of the Tendulkar Committee Report (2009). At the national level, poverty line for rural population is Rs. 446.68 while for urban population it is Rs. 578.8. Based on these poverty lines, 37.2% of India's total population was poor in 2004-05. In rural India, poverty was higher (41.8%) than in urban areas (25.7%). The Tendulkar Committee also updated the poverty lines for 1993-94 to allow comparisons to be made between the two periods. On the basis of these figures, it is possible to conclude that poverty headcount ratio for all India declined from 45.3% in 1993-94 to 37.2% in 2004-05. Thus, based on these figures one can safely conclude that growth in India has been pro-poor, as poverty has declined since 1993-94. But the critics question the methodology used in the official estimates and argue that the actual number of poor is significantly higher than the official estimates and that poverty had actually increased between 1993-94 and 2004-05 (e.g., Patnaik 2010, and Mehrotra and Mander 2009).

Habito (2009) has published international comparisons of 15 Asian countries in reducing poverty. For 2000-2008, these comparisons paint a sobering picture of India's performance in achieving inclusive growth in recent years, because India ranks 11th, followed by Philippines, Mongolia, Singapore and Myanmar. Ahead of India in this league were (in that order) Indonesia, Pakistan, China, Malaysia, Thailand, Vietnam, Sri Lanka, Nepal, Bangladesh and Cambodia. The comparisons are made in terms of the poverty elasticity of growth (PEG), which measures percentage reduction in poverty for every one percent of growth in GDP. In Indonesia, Pakistan and China, PEG exceeded one, implying that

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one percent growth in GDP resulted in more than one percent reduction in poverty. For the other countries that were also ahead of India in this comparison, the values of PEG ranged from -0.806 for Malaysia to -0.469 for Bangladesh. India's PEG was -0.154, implying only modest reduction in poverty for every one percent increase in GDP.

The continued rise of economic inequality in India – and around the world – is not inevitable. It is the result of policy choices. Governments can start to reduce inequality by rejecting market fundamentalism, opposing the special interests of powerful elites, and changing the rules and systems that have led to where we are today. They need to implement reforms that redistribute money and power and level the playing field.

Specifically, there are two main areas where changes to policy could boost economic equality: taxation and social spending.

1. **Taxation.** The role of taxation in reducing inequality has been clearly documented in developing countries. Tax can play a progressive role, or a regressive one, depending on the policy choices of the government.
2. **Social spending,** on public services such as education, health and social protection, is also important. Evidence from more than 150 countries – rich and poor, and spanning over 30 years – shows that overall, investment in public services and social protection can tackle inequality.

Accordingly Indian government's recent decision on adoption of Goods and Service tax (GST) has a new hope in near future on reaching the zenith of equality.

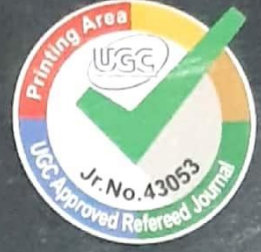
#### Strategy for Inclusive Growth GST and Poverty:

The Thirteenth Finance Commission's Task Force has come out with rational answers to these queries and said that the proposed switchover to the 'flawless' GST should be viewed as pro-poor and not regressive. The Task Force's studies show that primary food articles like rice and wheat are liable to tax by many states either by way of purchase tax or sales tax at a lower rate. As a result the incidence of tax on primary food articles comprises of two elements: a) tax on inputs and b) tax on output (primary food article). However, under the 'flawless' GST, all food items covered under the public distribution system are proposed





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## Nation and Nationalism— A Multidimensional Debate

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The term 'nation' is understood in different ways. It is employed to refer to a unit, which in turn, is a part of the complex concept of 'nation-state' or to a community striving for independent statehood, or to the presumed relationship between different individuals and groups based on some assumed political unity amongst them (Aloysius, 1997, p. 11). Thus, the concept 'nation' with its related terms such as nation-formation or nation-building, is varied. Even to this day intellectuals have not been able to give a precise definition to the term 'nationalism'. If some, while defining nationalism, stress the political aspect of nationalism, others give more attention to its cultural aspect. No one so far has been able to define the word precisely. It is not the domain of a particular person or group. Each one has and will have his/her share in contributing to the community feeling of nationalism. A. R. Desai calls it a movement of various classes and groups comprising of a nation, attempting to remove all economic, political, social, and cultural obstacles, which impede the realization of their aspirations (1998, p. 51). The definition by Rosa Luxemburg, which is quoted by Desai, clearly justifies what has been said so far. According to her, "National States and Nationalism are empty vessels in which each epoch and the class relations in each particular country pour their particular content" (Desai, 1998, p. 51). It is the feeling of oneness that creates nationalism and

the secure feeling solidifies the need for nationalism.

According to Partha Chatterjee, "Nationalism as an ideology is irrational, narrow, hateful and destructive. It is not an authentic product of any of the non-European civilization which, in each particular case, it claims as its classical heritage. It is wholly a European export to the rest of the world. It is also one of Europe's most pernicious exports, for it is not a child of reason or liberty, but of their opposite: of fervent romanticism, of political messianism whose inevitable consequence is the annihilation of freedom" (Chatterjee, 1986, p.7). But this statement by Chatterjee should not divert us from further discussing nationalism. 'Nationalism' has been one of the highly discussed and contested terms. Even to this day, it continues to be a complex mixture of an ideology of a class of people, the policy-orientation of a state, the 'noble' sentiment of pride and commitment to one's state, and a socio-political movement for nation-building, along with many more interpretations. This being the reality, it is but natural that questions of nationalism are highly value-laden. It is because they are nothing, but expressions of interests and power positions of individuals, groups, and even nation-states from time to time.

In his book, *Nations and Nationalism*, Ernest Gellner defines nationalism in the simplest possible terms. According to him, "nationalism is primarily a political principle, which holds that the political and the national unit should be congruent" (1983, p.1). He terms nationalism as a sentiment or a movement. Sentiments or movements are always attached to the self. "Nationalist sentiment is the feeling of anger aroused by the violation of the principle, or the feeling of satisfaction aroused by fulfilment. A nationalist movement is one actuated by a sentiment of this kind" (Gellner, 1983, p.1). When the spirit of modernization sweeps across and the people try to identify themselves as belonging to a particular community sharing common cultural





## Clique Regular Graphs

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### ABSTRACT

A maximal complete subgraph of  $G$  is a clique. The *minimum* (maximum) *clique number*  $\vartheta = \vartheta(G)$  ( $\omega = \omega(G)$ ) is the order of a minimum (maximum) clique of  $G$ . A graph  $G$  is clique regular if every clique is of the same order. Two vertices are said to dominate each other if they are adjacent. A set  $S$  is a dominating set if every vertex in  $V - S$  is dominated by a vertex in  $S$ . Two vertices are independent if they are not adjacent. The independent domination number  $i = i(G)$  is the order of a minimum independent dominating set of  $G$ . The order of a maximum independent set is the independence number  $\beta_0 = \beta_0(G)$ . A graph  $G$  is well covered if  $i(G) = \beta_0(G)$ . In this paper it is proved that a graph  $G$  is well covered if and only if  $\bar{G}$  is clique regular. We also show that  $\vartheta(\bar{G}) = i(G)$ .

**Keywords:** Clique, Minimum clique number, Maximum clique number, Domination number, Well covered graphs and clique regular graphs

### INTRODUCTION

All the graphs considered in this paper are finite, simple and undirected. For any undefined terminologies and notations refer to Harary (1969). If a graph  $G$  is isomorphic to  $r$  copies of a graph  $H$ , then we write it as  $G = rH$ . Two vertices are said to dominate each other if they are adjacent. A set  $S \subseteq V$  is a dominating set if every vertex in  $V - S$  is dominated by a vertex in  $S$ .

The *domination number*  $\gamma = \gamma(G)$  is the order of a minimum dominating set of  $G$ . The *upper domination number*  $\Gamma = \Gamma(G)$  is the maximum order of a minimal dominating set. These concepts of domination are well studied in (Cockayne & Hedetniemi, 1977; Walikar et al., 1979; Haynes et al., 1998; Kamath & Bhat, 2006; Kamath & Bhat, 2007; Bhat et al., 2011; Bhat, Surekha and Bhat, 2011; Bhat et al., 2013; Bhat et al., 2014). The vertex covering

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number  $\alpha_0 = \alpha_0(G)$  is the minimum number of vertices needed to cover all the edges of a graph while independence number  $\beta_0 = \beta_0(G)$  is the maximum number of vertices in an independent set of  $G$ . These two numbers are related by classical Gallai's Theorem:  $\alpha_0(G) + \beta_0(G) = p$ . The *upper vertex covering number*  $\epsilon = \epsilon(G)$  is the maximum order of a minimal covering of  $G$ . The *independent domination number*  $i = i(G)$  is the minimum order of an independent dominating set of  $G$ . Naturally, we have an extension of Gallai's theorem to these numbers as:  $\epsilon(G) + i(G) = p$ . A maximal complete subgraph is a *clique*. The minimum number of cliques (not necessarily maximal) that cover all the vertices of a graph is well known in graph theory as *partition number*  $\theta_0 = \theta_0(G)$  introduced by (Berge, 1962) and has been celebrated in Berge's conjecture on perfect graphs. Choudam et al. (1975) studied its edge analogue *line clique covering number*  $\theta_l(G)$  defined as the minimum number of cliques that cover all the lines of a graph. The minimum number of colours needed to properly colour the vertices of  $G$  is the *chromatic number*  $\chi = \chi(G)$ . Since independent sets and cliques exchange their properties on complementation  $\theta_0(G) = \chi(\bar{G})$ . Bhat et al. (2013) defined block domination parameters and studied their relationship between other domination parameters. In this paper we obtain few bounds on minimum clique number and characterized well covered graphs using clique regular graphs.

## MINIMUM CLIQUE NUMBER

The *minimum clique number*  $\vartheta(G)$  is the order of a minimum clique of  $G$  while the *maximum clique number*  $\omega(G)$  is the order of a maximum clique of  $G$ . It is immediate that  $\vartheta(G) \leq \omega(G)$ . Even though these two parameters are well studied in literature, the first parameter *minimum clique number*  $\vartheta(G)$  received less attention and we are interested in it than the later. If  $G$  has an isolated vertex, then  $\vartheta(G) = 1$ . If  $G$  is a triangle free graph without isolates, then  $\vartheta(G) = 2$ . The girth  $g(G)$  of a graph is the length of the shortest cycle in  $G$ . Girth of a graph is defined if  $G$  has a cycle otherwise we define  $g(G) = \infty$ . Since girth of any graph is at least 3,  $\vartheta(G) \leq g(G)$  if  $\vartheta(G) \leq 3$ . Moreover,  $\vartheta(G) \geq 4$  if then every minimum clique contains a triangle and hence  $g(G) = 3 < 4 \leq \vartheta(G)$ . It is well known that  $\omega(G) = \beta_0(\bar{G})$ . A similar result for minimum clique number is obtained in the next proposition.

**Proposition 1** For any graph  $G$ ,

$$\vartheta(G) = i(\bar{G})$$

**Proof.** Let  $\vartheta(G) = k$ , and  $S$  be the set of vertices of a minimum clique of  $G$ . Since independent sets and cliques exchange their properties on complementation,  $S$  forms a maximal independent set with minimum number of vertices in  $\bar{G}$ . Then by Ore's theorem (Ore, 1962), we have every maximal independent set is a minimal dominating set. Therefore,  $S$  is a minimum independent dominating set of  $\bar{G}$ . Hence  $\vartheta(G) = k = |S| = i(\bar{G})$ .



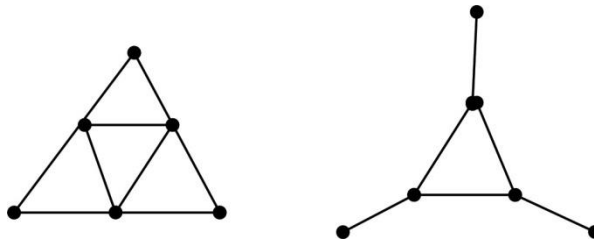


Figure 1. Hajo's Graph  $G$  and its complement (Haynes et al., 1998)

We can observe that for the Hajo's graph  $G$  in Figure 1,  $\vartheta(G) = 3$  and for the complement of Hajo's graph  $i(\bar{G}) = 3$ .

The domatic number  $\omega(G)$  is the maximum order of a partition of vertex set in to dominating sets. As  $\omega(G)$  served a best lower bound for chromatic number is evident from the known inequality,  $\omega(G) \leq \chi(G) \leq 1 + \Delta(G)$  (Cockayne & Hedetniemi, 1977, p. 250). A clique graph  $K_G(G)$  of  $G$  is a graph with vertex set as cliques of  $G$  and any two vertices in  $K_G(G)$  are adjacent if and only if the corresponding cliques in  $G$  have a vertex in common. Independence graph  $I(G)$  is a graph with vertex set as set of all maximal independent sets of  $G$  and any two vertices in  $I(G)$  are adjacent if they have a vertex in common. We observe that any maximal independent set in  $G$  is a clique in  $\bar{G}$  and vice versa. Hence  $K_G(\bar{G}) \cong I(G)$ . Cockayne & Hedetniemi (1977, p. 257) proved that if  $K_G(G)$  is an even cycle, then  $\vartheta(G) \leq d(G)$ . Zelinca (1981), constructively shown that the analogous assertion is false if  $K_G(G)$  is an odd cycle. Hence  $\vartheta(G)$  can exceed the domatic number. Thus  $\vartheta(G)$  and  $d(G)$  are incomparable. We now provide an upper bound for minimum clique number in terms of minimum degree and order of  $G$ . We use the following notations. Let  $N(v) = \{u \in V | u \text{ is adjacent to } v\}$  and  $N[v] = N(v) \cup \{v\}$ . Then  $\langle N[v] \rangle$  denote the subgraph induced by the set  $N[v]$ . Let  $\delta(G)$  and  $\Delta(G)$  denote the minimum and maximum degree of  $G$  while  $\bar{\delta} = \delta(\bar{G})$  and  $\bar{\Delta} = \Delta(\bar{G})$ . Let  $V_\delta = \{v \in V | \deg(v) = \delta\}$ .

**Proposition 2** For any graph  $G$  with minimum degree  $\delta(G)$ ,

$$\vartheta(G) \leq 1 + \delta(G).$$

Further, the equality holds if and only if  $\langle N[v] \rangle$  is a minimum clique of  $G$  for every  $v \in V_\delta$

**Proof.** We first note that  $\Delta + \bar{\delta} = \bar{\Delta} + \delta = p - 1$ . It is well known that  $i(G) \leq p - \Delta(G)$  (Haynes et al., 1998, p. 312). Therefore  $\vartheta(G) = i(\bar{G}) \leq p - \bar{\Delta} = 1 + \delta(G)$ .

Suppose that  $\vartheta(G) = 1 + \delta(G)$ . Then if  $\langle N[v] \rangle$  is not a minimum clique of  $G$  for some  $v \in V_\delta$  then  $\vartheta(G) < |\langle N[v] \rangle| = 1 + \delta(G)$  a contradiction.

Converse is straight forward and we omit the proof.

The bound is sharp for the complete graph  $K_n$  and star graph  $K_{1,n}$ .

The following results relate the different graph parameters which appears in (Haynes et al., 1998, p.374).



**Proposition 3.** For any graph  $G$

$$\frac{p}{1+\Delta} \leq \gamma(G) \leq i(G) \leq \beta_0(G) \leq \Gamma(G) \quad [1]$$

On complementing the result [1], we get the next corollary and one can see that the  $\vartheta(G)$  fits best in between the known graph parameters.

**Corollary 3.1** For any graph  $G$ ,

$$\frac{p}{p-\delta} \leq \gamma(\bar{G}) \leq \vartheta(G) \leq \omega(G) \leq \Gamma(\bar{G}). \quad [2]$$

The idiomatic number  $d_i = d_i(G)$  is the maximum order of partition of vertex set in to independent dominating sets. The idiomatic number does not exist for all graphs. A graph  $G$  is indominable if  $G$  admits an independent dominating set partition. The maximal clique partition number  $\theta_m = \theta_m(G)$  is the maximum order of partition of vertex set in to cliques of  $G$ . A graph which admits a clique partition is called clique partitionable. Hence  $\theta_m(G) = d_i(\bar{G})$ . If  $G$  is indominable then  $\bar{G}$  is clique partitionable. If both  $G$  and  $\bar{G}$  are indominable then  $G$  is called strongly indominable. We now provide an upper bound to domination number of an indominable graph in terms of minimum clique number.

**Proposition 4.** If  $G$  or  $\bar{G}$  is indominable

**Proof.** If  $G$  or  $\bar{G}$  is indominable, it is proved that  $\vartheta(G) \leq d_i(G) \leq d(G)$  (Walikar et al., 1979, p.109). Therefore  $\gamma(G)\vartheta(G) \leq i(G)\vartheta(G) \leq i(G) d_i(G) \leq p$ . This yields the desired inequality.

The bound is attained for any even cycle, regular bipartite graph or complete graph.

**Corollary 4.1** If  $G$  is clique partitionable then  $i(G) \leq d_i(\bar{G}) = \theta_m(G)$ - is the partition vertex set in to maximal cliques of  $G$ .

Walikar et al. (1979) has proved that for any cubic graph, if there exists a maximal clique of order 2 then  $\gamma(\bar{G}) = 2$ . We now prove a stronger result with much more ease and the above result is a corollary to the next proposition.

**Proposition 5.** For any graph  $G$  with,  $\vartheta(G) = 2$  then  $\gamma(\bar{G}) = i(\bar{G}) = 2$

**Proof.** From Proposition 1, we have  $2 = \vartheta(G) = i(\bar{G})$ . As every independent dominating set is a dominating set we have  $\gamma(\bar{G}) \leq i(\bar{G})$ . Suppose  $\gamma(\bar{G}) < i(\bar{G})$  then  $\gamma(\bar{G}) = 1$ . As any singleton set is independent we then have  $i(\bar{G}) = 1$ . This is a contradiction to the statement that  $i(\bar{G}) = 2$ . Therefore  $\gamma(\bar{G}) = i(\bar{G})$ .

**Corollary 5.1.** If  $G$  is a cubic graph with a maximal clique of order 2, then  $\gamma(\bar{G}) = 2$ .

**Proof.** Since  $G$  is cubic and there exists a maximal clique of order 2 together implies that . Then the result follows by Proposition 2.5.

## CLIQUE REGULAR GRAPHS

The concept of well covered graphs is studied in (Plummer, 1970; Plummer, 1993; Dean &

Zeto, 1994; Ravindra, 1997). A graph  $G$  is *well covered* if every maximal independent set is of same order. In other words,  $G$  is well covered if and only if  $i(G) = \beta_0(G)$ . Equivalently,  $\epsilon(G) = \alpha_0(G)$ .

The above definition motivated the description of another special class of graphs called clique regular graphs. A graph  $G$  is *clique regular* if every clique is of same order. Thus  $G$  is  $k$ -clique regular graph if  $\omega(G) = \vartheta(G) = k$ . For example, 3-clique regular graph and 5-clique regular graphs are shown in the Figure 2.

**Remark 1.** The maximum number of vertices in a minimal vertex cover is called maximum vertex covering number  $\epsilon(G)$ . It is proved that for any graph  $G$ ,  $\epsilon(G) + i(G) = p$  (Haynes, et al., 1998, p. 524). Using Proposition 5, this result can now be restated as  $\epsilon(G) + \vartheta(\bar{G}) = p$  or equivalently,  $\epsilon(\bar{G}) + \vartheta(G) = p$ .

**Remark 2.** Similarly, from the above Remark 1, we may write  $\alpha_0(G) + \beta_0(G) = p$  (Gallai's Theorem) as  $\alpha_0(G) + \omega(\bar{G}) = p$  or equivalently,  $\alpha_0(\bar{G}) + \omega(G) = p$ .

**Example 1.**

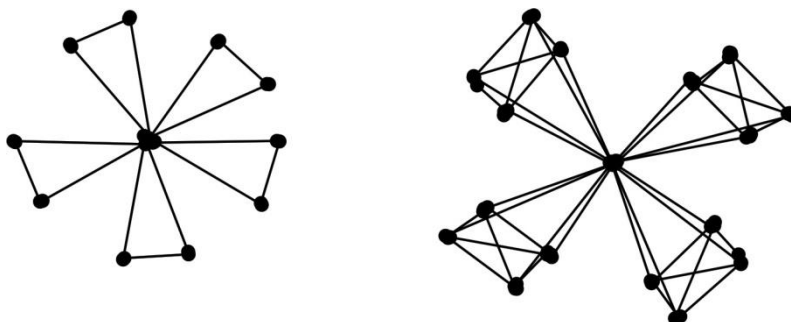


Figure 2. A 3-clique regular and 5-clique regular graphs (Haynes et al., 1998)

The advantage of knowing  $\vartheta(G)$  and  $\omega(G)$  is that one can easily determine the independent domination number and independence number of  $\bar{G}$ . Using this technique  $i(\bar{G})$  and  $\beta_0(\bar{G})$  for some standard graphs are obtained for some standard graph. A double star is a tree  $T = K_{1,n} * K_{1,m}$  obtained by joining the two nonpendant vertices of  $K_{1,n}$  and  $K_{1,m}$ .

### Proposition 6

- (i) For any double star  $T = K_{1,n} * K_{1,m}$ ,  
 $i(\bar{T}) = 2 = \beta_0(\bar{T})$  ;  $\vartheta(\bar{T}) = \min(m + 1, n + 1)$  and  $\omega(\bar{T}) = m + n$
- (ii) For any tree  $T$ ,  $i(\bar{T}) = 2 = \beta_0(\bar{T})$ .
- (iii) For any triangle free graph,  $i(\bar{G}) = 2 = \beta_0(\bar{G})$ .

**Proof.** Note that for any double star,  $T = K_{1,n} * K_{1,m}$ ,  $i(T) = \min(m + 1, n + 1)$ ,  $\beta_0(T) = m + n$  and  $\vartheta(T) = \omega(T) = 2$ . Then the result (i) follows from Proposition 5 and Remark 1. The rest of the results can be proved similarly.



As any Cube graph  $Q_n$ , Petersens graph, Hexagonal hub graph in Figure 3 are triangle free graphs without isolates and hence the next corollary.

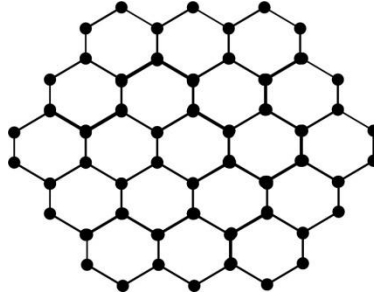


Figure 3. Hexagonal hub graph H (Haynes et al.,1998)

### Corollary 6.1

- (i) If  $G$  is a Petersen's graph, then  $i(\bar{G}) = 2 = \beta_0(\bar{G})$
- (ii) For any cube graph  $Q_n$ ,  $i(\bar{Q}_n) = 2 = \beta_0(\bar{Q}_n)$
- (iii) For the hexagonal hub graph  $H$ ,  $i(\bar{H}) = 2 = \beta_0(\bar{H})$
- (iv) For any grid graph  $G$ ,  $i(\bar{G}) = 2 = \beta_0(\bar{G})$
- (v) For any wheel graph,  $W_n$ ,  $i(\bar{W}_n) = \beta_0(\bar{W}_n) = 4$ , if  $n = 4$   
and  $i(\bar{W}_n) = \beta_0(\bar{W}_n) = 3$ , if  $n \geq 5$

**Proposition 7** For any graph  $G$ ,

- (i)  $\beta_0(\overline{B_G(G)}) = \Delta_{vb}(G) = \Delta_{bv}(B_G(G))$
- (ii)  $i(\overline{B_G(G)}) = \delta_{cvb}(G) = \delta_{bv}(B_G(G))$
- (iii)  $i(\overline{C_G(G)}) = \delta_{NPC}(G) = \delta_{cvb}(B_G(G))$
- (iv)  $\beta_0(\overline{C_G(G)}) = \Delta_c(G) = \Delta_{cvb}(B_G(G))$

**Proof.** For any graph  $G$ , every block of the block graph  $B_G(G)$  is a clique. Since all the blocks incident on a cut vertex of  $G$  are mutually adjacent, these blocks form a clique in  $B_G(G)$ . Therefore, number of blocks incident on a cut vertex  $= d_{vb}(G) =$  number of vertices in the corresponding block in  $B_G(G) = d_{bv}(B_G(G))$ . Hence  $\Delta_{vb}(G) = \Delta_{bv}(B_G(G)) = \omega(B_G(G))$ . Similarly,  $\delta_{cvb}(G) = \delta_{bv}(B_G(G)) = \vartheta(B_G(G))$ . Then the results (i) and (ii) follow by Proposition 5 and Remark 1.

Again, for any graph  $G$ , every block of the cutvertex graph  $C_G(G)$  is a clique. Since all cutvertices in a nonpendant block are mutually adjacent, these cutvertices form a clique in  $C_G(G)$ . Therefore, number of cutvertices incident on a block  $= d_c(G) =$  number of vertices in

the corresponding block in  $C_G(G) = d_{bv}(C_G(G))$ . Hence  $\Delta_c(G) = \Delta_{bv}(C_G(G)) = \omega(C_G(G))$ . Similarly,  $\delta_{NPC}(G) = \delta_{bv}(C_G(G)) = \vartheta(C_G(G))$ . Then the results (iii) and (iv) follow by Proposition 5 and Remark 1.

**Proposition 8** *For any graph  $G$ , with maximum degree  $\Delta(G)$  and minimum degree  $\delta(G)$ ,*

- (i)  $\beta_0(\overline{L(G)}) = \Delta(G)$
- (ii)  $i(\overline{L(G)}) = \delta(G)$

**Proof.** Let  $v$  be a vertex of maximum degree  $\Delta(G)$  and  $x$  be an edge containing the vertex  $v$ . Then all the  $\Delta(G)$  edges incident on  $v$  are mutually adjacent and hence form a maximum clique of order  $\Delta(G)$  in  $L(G)$ . Hence  $\omega(L(G)) = \Delta(G)$ . The result (ii) follows by Proposition 5 and Remark 1.

The following corollaries are immediate from the above proposition.

**Corollary 8.1** *If  $G$  is regular then  $L(G)$  is clique regular*

**Corollary 8.2** *If  $G$  is regular then complement of  $L(G)$  is well covered*

## DISCUSSION AND CONCLUSION

A graph is regular if every vertex is of same degree. This class of graphs are well studied in literature. Here we have introduced and studied a new class of graphs called clique regular graphs. It is observed that every regular graph need not be clique regular and every clique regular graph need not be regular. The properties of clique regular graphs can be studied in depth as future work. The effect of regular cliques in  $G$  can be extended to Line graph, Block graph and clique graphs.

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## ORIGINAL RESEARCH PAPER

Commerce

### MAPPING OF REQUIRED LEADERSHIP COMPETENCY OF HR PROFESSIONALS EMPLOYED IN ITES - BPO COMPANIES IN BANGALORE CITY

**KEY WORDS:** Competency Mapping, HR Professionals, HR Challenges

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#### ABSTRACT

ITES/ BPO Companies have become a potential of employment in the modern era. They are offered jobs depending upon their educational qualification. ITES/BPO sector is a subsidy of Information Technology industry. They generate huge revenue to the economy of the country. The competency of the work force is very important to achieve the organization goals and targets. There is urgent need to map the competencies of the human resource professionals in these ITES/ BPO companies. It is understood that in the modern times a competent, productive and industrious persons have better demand with regard to employment. The competencies that are once needed for the HR professionals have become insufficient to face the present day HR challenges, hence there is a need to map competencies. According to the HR literature, Competency has many dimensions such as Leadership competencies (LC), Interpersonal competencies (IC), Business competencies (BC), Technical competencies (TC), Analytical competencies (AC), and Technological competencies TGC). The present study focus on presenting the study done on required competency levels of the HR Professionals employed in ITES / BPO companies in Bangalore city. The Association between the level of leadership competency and various socio economic factors of the respondents has been analyzed in the study.

#### INTRODUCTION

ITES companies are increasing in number due to the growth and quick development of information technology. Today everywhere there is digitalization and maximum use of media specifically in the field of. ITES / BPO companies operate on voice, non-voice and both work processes. They are increasing in number from time to time together with employment opportunities for the young generation. There is huge human resources requirement. These companies face many HR challenges also in globalized environment. Welbourne and Cyr (1999) have highlighted the role of human resource professionals as an important determinant of organizational performance. Business Process Outsourcing (BPO) is the delegation of one or more IT-intensive business processes to an external provider that in turn owns administers and manages the selected process based on defined and measurable performance criteria. Business Process Outsourcing (BPO) is one of the fastest growing segments of the Information Technology Enabled Services (ITES) industry. Competency mapping is a process to identify and describe competencies that are the most critical for success in a work situation or work role.

#### COMPETENCY MAPPING

Competency Mapping is processes of identifying key competencies for an organization and/or a job and incorporating those competencies throughout the various processes (i.e. job evaluation, training, recruitment) of the organization. It examines strengths of the individual in areas like team structure, leadership, and decision-making. Competency mapping helps employees to overcome the weakness through right measure through the available opportunities. Boyatzis (1982) defined competency as 'an underlying characteristic of a person which results in effective and/ or superior performance in a job'. A competency is the capability of applying or using knowledge, skills, abilities, behaviours, and personal characteristics to successfully perform critical work tasks, specific functions, or operate in a given position. According to Brockbank and Ulrich (2003), a competency domain refers to a broad group to which homogenous and/or similar competencies belong. Each competency domain comprises of competencies (competency factors).

#### LITERATURE REVIEW

Boyatzis (2007) adopted the term competency as 'an underlying characteristic of an individual that is casually related to effective or superior performance in a job'. He identified that there were 19 generic competencies that outstanding managers tend to have. He clubbed those 19 generic management competencies into five distinct clusters as goal and action management, leadership,

human resources management, directing subordinates and focus on others. Yuvaraj (2011) has explained the Job Competencies required working in a manufacturing industry, professionals for knowledge, ability and attitude. Gap analysis was also made to a limited extend. Md. Ishtiaq Uddin, et. al. (2012) in his study 'Competency Mapping: A Tool for HR Excellence' has explained various tools for implementing Competency Model including Job Analysis, Job Description, Job Specification, Competency Matrix, 360 degree Feedback etc. He is of the view that Competency mapping can also be used for coaching and succession planning, considering the significance of Competency Mapping for individual and organizational growth, the present study was undertaken. In this study, efforts have been made to elaborate the various competencies with minute parameters and to correlate them with the managerial competence level. Solomon (2013) in his study on Competency mapping has tried to explore the level of Competency prevailing among the executives of public sector. The results of the study show that nearly half of the respondents have moderate level of managerial HR and general competencies. Schoonover (2003) suggested that a competency framework structured into four building blocks is vital. These include personal attributes, leadership and management competencies, HR core competencies, and HR role-specific competencies. Leadership and management category encompasses eight competencies namely visioning and alignment, strategic thinking, networking, resource management, teamwork, process excellence, performance development, and goal setting. Chen et al. (2005) advocated that the workplace learning and performance competency groups that are important for the HR practitioners in Taiwan are: business competency, interpersonal competency, analytical competency, leadership competency, technological competency, and technical competency groups. Dr. Murlidhar and Sunetra Khatod Jain (2015) stated in a paper that Competencies are enhanced through training and job rotation. Job rotation acts as a learning experience for the employees and it widens their horizon about the company itself. To do all this effectively and efficiently, competency mapping for each recruitment cycle will ease the work, competency based recruitment will result proper selection as per criteria found from mapping and assessment, employee will know his job and can perform his more independently and employee morale will be boost up.

#### RESEARCH METHODOLOGY

All human resource professionals employed in the ITES (Information technology enabled services) / BPO (Business process outsourcing) companies in Bangalore city constituted the universe. A sample of 380 respondents was selected for the present study. A



snow-ball sampling method was adopted in the selection of companies and the HR professionals from the sample companies were selected on a convenient sampling basis. 43 companies were selected for the survey and based on the employee strength they were segregated as large, medium and small companies. A well structured survey questionnaire was used in the survey along with a detailed interview with the respondents. The questionnaire carried the questions relating to the socio economic profile of the respondents namely the type of company, age of the respondents, gender, marital status, educational status, type of work process, type of manager, income, experience of the respondents etc. The questions relating to the competency were based on certain competency factors having many sub-questions. The survey questionnaire included questions under six categories namely leadership competencies, interpersonal competencies, business

competencies, technical competencies, analytical competencies and technological competencies. Both primary and secondary data were collected and used for the study. The Primary Data were collected through interviews along with well structured questionnaire. The Secondary data were collected through Internet and other journal publications.

### ANALYSIS OF DATA AND RESULTS

Analysis of the profile of the respondents indicated that they are employed in Indian companies. For better and in depth analysis the respondents are divided into 4 categories based on their functions namely employment and placement managers, training managers, health and safety managers and project managers

The detailed profile of respondents is presented below

**Table: 1 Profile of Respondents**

Factor	Group	Number of Respondents	Percentage of respondents
Type of the Company	Indian	380	100.0
	Foreign	0	.0
	Total	380	100.0
Age	<25	51	13.5
	25-30	101	26.6
	30-35	139	36.7
	35-40	80	21.1
	>40	8	2.1
	Total	379	100.0
Sex	Male	207	54.5
	Female	173	45.5
	Total	380	100.0
Marital Status	Married	231	60.8
	Unmarried	133	35.0
	Divorced	9	2.4
	Widow/Widower	3	.8
	Living-in	4	1.1
	Total	380	100.0
Educational Status	PG-Professional	116	30.5
	PG □ Technical	211	55.5
	PG □ PhD	53	13.9
	Total	380	100.0
Type of Work Process	Voice	107	28.2
	Non-Voice	155	40.8
	Both	118	31.1
	Total	380	100.0
Nature of Appointment	Regular	189	49.7
	Project Based	124	32.6
	Probationary	67	17.6
	Total	380	100.0
Years of Experience in Current HR Role	<2	12	3.2
	2-4	178	46.8
	4-6	140	36.8
	6-8	29	7.6
	8-10	17	4.5
	>10	4	1.1
	Total	380	100.0
Monthly Income ( in Rs.1000s )	Up to20	5	1.3
	20-30	142	37.4
	30-40	132	34.7
	40 □ 50	40	10.5
	50-60	40	10.5
	>60	21	5.5
	Total	380	100.0
Total experience in BPO industry	Below 1 year	4	1.1
	1-2 years	55	14.5
	2-3 years	162	42.6
	3-4 years	56	14.7
	4 -5 years	45	11.8
	5 years and above	58	15.3
	Total	380	100.0
Total experience in this company	0	1	.3
	0-3 months	1	.3

	3-6 months	40	10.5
	6-12 months	123	32.4
	1-2 years	57	15.0
	2-3 years	37	9.7
	3-4 years	76	20.0
	4-5 years	30	7.9
	Above 5 years	15	3.9
	Total	380	100.0
No. of BPO companies you have worked before	0	2	.5
	1	10	2.6
	2	51	13.4
	3	156	41.1
	4	116	30.5
	5 and above	45	11.8
	Total	380	100.0
Category Managers	Employment and Placement	153	40.3
	Training	140	36.8
	Health and Safety	46	12.1
	Project Manager	41	10.8
	Total	380	100.0

Source: Primary Data Collected by the Researcher

In the above table I data regarding the demographic factors is presented. The respondents are from 43 ITES/BPO companies situated in Bangalore region. Among the respondents 54.47 percent are males and 45.52 percent are females, 60.78 percent of them are married and 35 percent are unmarried, rest of them are divorced and living in at 2.36 percent 1 percent respectively. Majority of the respondents belong to very young age between 25 years to 35 years and they number around 249 which is 63 percent of the respondents. 85.5 percent of them are either post graduates with technical course or post graduates with professional course. The respondents are involved in voice and non-voice based type of work. Majority of them are on regular job appointment order and more than 40 percent are on project based appointment order. 72 percent of the respondents draw a salary around 20000 to 40000 in a month. The experience of respondents working in ITES/ BPO is 2-3 years only on an average; the total experience as human resource managers varies from 2 to 6 years who are 82 percent.

#### ANALYSIS OF THE REQUIRED/EXPECTED LEADERSHIP COMPETENCY OF HR PROFESSIONALS

As demographic factors are observed there are 4 types of categories: A) Employment and Placement managers, B) Training managers, C) Health and Safety managers, D) Project managers. The nature of the job is important, it is expected to vary. Expected

competencies are laiciated from the respondents under leadership competency domain.

#### LEADERSHIP COMPETENCY

Leadership has been described as the process of social influence in which one person can enlist the aid and support of others in the accomplishment of a common task. A definition more inclusive of followers is that Leadership is ultimately about creating a way for people to contribute to making something extraordinary happen. Leadership is a matter of intelligence, trustworthiness, humane, courage, and discipline. When one has all five virtues together, each appropriate to its function, then one can be a leader. Perception statements on the various competency factors of Leadership competency, namely, Decision making, Knowledge of company's vision and mission, Inspiring and motivating others, Assembling strong teams, Process management, Conflict management, Consensus and negotiation skills, Empowering and training People employees. Primary data for these factors were collected on a five point Likert's scale a Very Low, Low, Moderate, High and Very High which were converted to corresponding numerical scores as 1,2,3,4 and 5 respectively. Based on the value of average score 'Consensus and Negotiation skills' has emerged as the top ranking leadership competency factor for the HR professionals employed in the ITES/ BPO companies. Categories of rating: < 1 to 2.5 considered as Low, 2.5 to 3.5 is considered as Moderate, 3.5 to 5 is considered as High.

Table 2: Describes the required decision making competency and knowledge of company's vision and mission

Competency		1		2		3		4		5		Mean	S.D	KW test	p value
		Freq	%	Freq	%	Freq	%	Freq	%	Freq	%				
Decision making	Employment and Placement	1	.7	9	5.9	51	33.3	55	35.9	37	24.2	3.77	.91	1.125	.771
	Training	2	1.4	7	5.0	39	27.9	63	45.0	29	20.7	3.79	.88		NS
	Health and Safety	0	.0	1	2.2	15	32.6	20	43.5	10	21.7	3.85	.79		
	Project Manager	0	.0	1	2.4	17	41.5	17	41.5	6	14.6	3.68	.76		
	Total	3	.8	18	4.7	122	32.1	155	40.8	82	21.6	3.78	.87		
Knowledge of company's vision and mission	Employment and Placement	0	.0	11	7.2	48	31.4	58	37.9	36	23.5	3.78	.89	3.271	.352
	Training	0	.0	8	5.7	44	31.4	63	45.0	25	17.9	3.75	.81		NS
	Health and Safety	0	.0	1	2.2	16	34.8	20	43.5	9	19.6	3.80	.78		
	Project Manager	0	.0	5	12.2	16	39.0	14	34.1	6	14.6	3.51	.90		
	Total	0	.0	25	6.6	124	32.6	155	40.8	76	20.0	3.74	.85		

Source: Primary data

#### Decision

When we analyse the above table with regard to decision making 40.8percent and 21.6percent of the respondents opine that expectation towards decision making competency was high and very high respectively. And 32.1 percent of opinion that it was moderate. Rest of them (4.7percent+.8percent) 5.5percent opine that expectation was low. Over all on an average (Mean) level of

#### Making

expectation towards decision making competency was high with mean and SD  $3.78 \pm .87$ (SD). Further when it is considered among different categories of respondents expectation towards decision making competency was high with Mean and S.D of employment and placement managers =  $3.77 \pm .91$ (SD), training managers  $3.79 \pm .88$ , health and safety managers  $3.85 \pm .79$ , project managers  $3.68 \pm .76$ . Test shows that there is no significant difference between the different types of professions (categories) with respect to decision making.



### Knowledge of companies' vision and mission:

When we analyse the above table concerning knowledge of companies' vision and mission, 40.8 percent and 20.0 percent of the respondents opine that expectation towards knowledge of companies' vision and mission competency was high and very high respectively. And 32.6 percent of opinion that it was moderate. Rest of them (6.6percent + 0percent) 6.6percent opine that expectation was low. Over all on an average (mean) level of expectation towards knowledge of companies vision and mission

competency was high with mean and SD  $3.74 \pm .85(\text{SD})$ . Further when it is considered among different categories of respondents' expectation towards knowledge of companies vision and mission was high with Mean and S.D of employment and placement managers =  $3.78 \pm .89(\text{SD})$ , training managers  $3.75 \pm .81$ , health and safety managers  $3.80 \pm .78$ , project managers  $3.51 \pm .90$ . Test shows that there is no significant difference between the different types of professions (categories).

**Table 3: Describes the required competency regarding inspiring and motivating others**

Competency factors		1		2		3		4		5					
		Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Mean	S.D	KW test	p value
Inspiring and motivating others	Employment and Placement	1	.7	9	5.9	37	24.2	73	47.7	33	21.6	3.84	.85	2.589	.459
	Training	0	.0	9	6.4	41	29.3	57	40.7	33	23.6	3.81	.87		NS
	Health and Safety	0	.0	2	4.3	14	30.	19	41.3	11	23.9	3.85	.84		
	Project Manager	1	2.4	3	7.3	13	31.7	19	46.3	5	12.2	3.59	.89		
	Total	2	.5	23	6.1	105	27.6	168	44.2	82	21.6	3.80	.86		
Assembling strong teams	Employment and Placement	0	.0	9	5.9	46	30.1	64	41.8	34	22.2	3.80	.85	3.601	.308
	Training	1	.7	12	8.6	39	27.9	59	42.1	29	20.7	3.74	.91		NS
	Health and Safety	0	.0	4	8.7	16	34.8	18	39.1	8	17.4	3.65	.87		
	Project Manager	0	.0	4	9.8	16	39.0	16	39.0	5	12.2	3.54	.84		
	Total	1	.3	29	7.6	117	30.8	157	41.3	76	20.0	3.73	.88		

Source: Primary data

### Inspiring and motivating others:

When we analyse the above table with regard to Inspiring and motivating others 44.2 percent and 21.6 percent of the respondents opine that expectation towards inspiring and motivating others competency was high and very high respectively. And 27.6percent of opinion that it was moderate. Rest of them (6.1percent + .5percent) 6.6percent opine that expectation was low. Over all on an average (mean) level of

expectation towards inspiring and motivating others competency was high with mean and SD  $3.80 \pm .86 (\text{SD})$ . Further when it is considered among different categories of respondents' expectation towards inspiring and motivating others was high with Mean and S.D of employment and placement managers =  $3.84 \pm .85(\text{SD})$ , training managers  $3.81 \pm .87$ , health and safety managers  $3.85 \pm .84$ , project managers  $3.95 \pm .8$ . Test shows that there is no significant difference between the different types of professions (categories) with respect to conflict management competency  $p = .963 > 0.05$ .

**Table 4: Describes the required competency regarding process management and conflict management competency**

Competency factors		1		2		3		4		5					
		Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Mean	S.D	KWtest	p value
Process management	Employment and Placement	0	.0	12	7.8	51	33.3	60	39.2	30	19.6	3.71	.87	4.202	.240
	Training	1	.7	15	10.7	24	17.1	71	50.7	29	20.7	3.80	.92		NS
	Health and Safety	0	.0	2	4.3	11	23.9	19	41.3	14	30.4	3.98	.86		
	Project Manager	0	.0	1	2.4	13	31.7	18	43.9	9	22.0	3.85	.79		
	Total	1	.3	30	7.9	99	26.1	168	44.2	82	21.6	3.79	.88		
Conflict management	Employment and Placement	0	.0	15	9.8	47	30.7	67	43.8	24	15.7	3.65	.86	4.011	.260
	Training	0	.0	10	7.1	47	33.6	59	42.1	24	17.1	3.69	.84		NS
	Health and Safety	0	.0	0	.0	12	26.1	25	54.3	9	19.6	3.93	.68		
	Project Manager	0	.0	3	7.3	13	31.7	14	34.1	11	26.8	3.80	.93		
	Total	0	.0	28	7.4	119	31.3	165	43.4	68	17.9	3.72	.84		

Source: Primary Data

### Process Management:

When we analyse the above table concerning the process management, 44.2percent and 21.6percent of the respondents opine that expectation towards process management competency was high and very high respectively. And 21.6percent of opinion that it was moderate. Rest of them (7.9percent + .3percent) 8.2percent opine that expectation was low. Over all on an average (Mean) level of expectation towards process management competency was high with mean and SD  $3.79 \pm .88(\text{SD})$ . Further when it is considered among different categories of respondents' expectation towards process management competency was high with Mean and S.D of employment and placement managers  $3.71 \pm .87(\text{SD})$ , training managers  $3.80 \pm .92$ , health and safety managers  $3.98 \pm .86$ , project managers  $3.85 \pm .79$ . Test shows that there is no significant difference between the different types of professions (Categories) with respect to expectation towards process management competency was high with mean and SD  $3.79 \pm .88(\text{SD})$ . Test shows that there is no significant difference

between the different types of professions (Categories) with respect to process management competency  $p = .963 > 0.05$ .

### Conflict

When we analyse the above table regarding conflict management, 43.4percent and 17.9percent of the respondents opine that expectation towards conflict management competency was high and very high respectively. And 31.3percent of opinion that it was moderate. Rest of them (7.4percent + .0percent) 7.4percent opine that expectation was low. Over all on an average (Mean) level of expectation towards conflict management competency was high with mean and SD  $3.72 \pm .84(\text{SD})$ . Further when it is considered among different categories of respondents expectation towards conflict management competency was high with Mean and S.D of employment and placement managers  $3.65 \pm .86(\text{SD})$ , training managers  $3.69 \pm .84$ , health and safety Managers  $3.93 \pm .68$ , project managers  $3.80 \pm .93$ . Test shows that there is no significant difference between the different types of professions (Categories) with respect to conflict management competency  $p = .963 > 0.05$ .

### Management:

**Table 5: Describes the required competency regarding consensus and negotiation skills and empowering and training people**

Competency factors		1		2		3		4		5					
		Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Mean	S.D	KW test	p value
Consensus and negotiation skills	Employment and Placement	0	.0	13	8.5	37	24.2	60	39.2	43	28.1	3.87	.92	3.639	.303
	Training														

	Training	0	.0	16	11.4	37	26.4	61	43.6	26	18.6	3.69	.90		NS
	Health and Safety	0	.0	4	8.7	9	19.6	21	45.7	12	26.1	3.89	.90		
	Project Manager	0	.0	4	9.8	11	26.8	18	43.9	8	19.5	3.73	.90		
	Total	0	.0	37	9.7	94	24.7	160	42.1	89	23.4	3.79	.91		
Empowering and training People	Employment and Placement	0	.0	7	4.6	49	32.0	61	39.9	36	23.5	3.82	.84	2.959	.398
	Training	0	.0	6	4.3	40	28.6	61	43.6	33	23.6	3.86	.82		NS
	Health and Safety	0	.0	1	2.2	16	34.8	21	45.7	8	17.4	3.78	.76		
	Project Manager	0	.0	6	14.6	14	34.1	12	29.3	9	22.0	3.59	1.0		
	Total	0	.0	20	5.3	119	31.3	155	40.8	86	22.6	3.81	.85		

Source: Primary data

#### Consensus and negotiation skill:

In the analysis of the above table with regard to consensus and negotiation skill 42.1 percent and 23.4 percent of the respondents opine that expectation towards consensus and negotiation skills competency was high and very high respectively. And 24.7 percent of opinion that it was moderate. Rest of them (9.7 percent+.0 percent) 9.7 percent opine that expectation was low. Over all on an average (mean) level of expectation towards Consensus and negotiation skills competency was high with mean and SD  $3.79 \pm .91$ (SD). Further when it is considered among different categories of respondents expectation towards Consensus and Negotiation Skills competency was high with mean and S.D of employment and placement managers =  $3.87 \pm .92$ (SD), training managers  $3.69 \pm .90$ , Health and safety Managers  $3.89 \pm .90$ , Project managers  $3.73 \pm .90$ , Test shows that there is no significant difference between the different types of professions (Categories) with respect to Consensus and Negotiation Skills competency  $p=.303>0.05$ .

#### Empowering and training people:

In the analysis of the above table with regard to Empowering and training people 40.8 percent and 22.6 percent of the respondents opine that expectation towards empowering and training people competency was high and very high respectively. And 31.3 percent of opinion that it was moderate. Rest of them (5.3 percent+.0 percent) 5.3 percent opine that expectation was low. Over all on an average (Mean) level of expectation towards empowering and training people competency was high with mean and SD  $3.81 \pm .85$ (SD). Further when it is considered among different categories of respondents expectation towards empowering and training people competency was high with Mean and S.D of Employment and placement managers =  $3.82 \pm .84$ (SD), Training managers  $3.86 \pm .82$ , health and safety managers  $3.78 \pm .76$  and project managers  $3.59 \pm 1.00$ . Test shows that there is no significant difference between the different types of professions (Categories) with respect to empowering and training people competency  $p=.398>0.05$ .

#### FINDINGS

1. More than 75 % of the HR Professionals employed in the ITES /BPO companies are in the age of below 35 years.
2. 85.5 percent of the selected HR Professionals are Graduates
3. Age, marital Status, Educational Status, Present Position held, Nature of Appointment, Experience in Current HR Role and Monthly income of respondents have a significant association with the level of leadership competency of HR professionals.
4. There is significant difference in their levels of leadership competency among the various categories of managers
5. Male HR professionals are more compared to female HR professionals namely 54.47 percent
6. Most of the HR professionals are having 2 to 6 years experience in present ITES-BPO. It shows that the turnover rate of HR Professionals is high.

#### CONCLUSION

Competency of HR professionals is a vital factor in achieving the objectives and goals of the ITES /BPO companies as they face may HR challenges in the present days. Among various competency clusters of HR professionals, the Leadership competency is predominant. The study revealed that there is no considerable gap in the leadership competency among the HR professionals employed in the ITES /BPO companies located in Bangalore City.

The findings of the study would be helpful in designing specific training programs for the low competent HR professionals in future.

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## Bounds On Independence Number And Clique Independence Number Of A Graph

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### Abstract

A set  $S \subseteq V$  is independent if no two vertices in  $S$  are adjacent. The order of a maximum independent set is the independence number  $\beta_0 = \beta_0(G)$ . A maximal complete subgraph of  $G$  is called a clique. A set  $L$  of cliques of  $G$  is said to be clique independent set (CI-set) if no two cliques have a vertex in common. The clique independence number  $\beta_c = \beta_c(G)$  is the maximum number of cliques in a CI-set of  $G$ . In this paper several bounds for independence number and clique independence number are derived and we characterized the graphs attaining some of these bounds.

**AMS Subject Classification:** 05C69

**Key Words and Phrases:** Independence number; Clique independence number; Minimum clique number; Maximum clique number; Well clique covered graphs

## 1 Introduction

For any undefined terminologies and notations we refer [5]. By a graph  $G = (V, E)$  we mean a connected finite simple graph with  $|V| = p$  and  $|E| = q$  called the order and size of the graph. A set  $S \subseteq V$  is a dominating set if every vertex not in  $S$  is adjacent to at least one vertex in  $S$ . The domination number  $\gamma = \gamma(G)$  is the minimum order of a minimal dominating set of  $G$ . For a detailed survey of domination theory, one can refer [3, 9]. A set  $S \subseteq V$  is a vertex cover of  $G$  if every edge is incident on some vertex in  $S$ . The vertex covering number  $\alpha_0 = \alpha_0(G)$  is the minimum order of a minimal covering of  $G$ . On the other hand, a set  $S \subseteq V$  is said to be independent if no two vertices in  $S$  are adjacent. The independent domination number  $i = i(G)$  (independence number  $\beta_0 = \beta_0(G)$ ) is the minimum (maximum) order of a maximal independent set of  $G$ . These parameters are related by the classical Gallai's Theorem  $\alpha_0(G) + \beta_0(G) = p$ . A vertex  $v$  is a cut vertex if  $G - v$  is disconnected. A block is a maximal subgraph of  $G$  without any cut vertices. A

maximal complete subgraph is called a clique. Let  $K(G)$  denote the set of all cliques in  $G$  and  $\mathbb{K}(G) \neq \emptyset$ . A graph  $G$  is called a block graph if every block of  $G$  is a clique. The minimum number of cliques (not necessarily maximal) that cover all the vertices of a graph is well known in graph theory as partition number  $\theta_0(G)$  (also called as point clique covering number) introduced by Berge [1] and has been celebrated in Berge's conjecture on perfect graphs. In section 2 we give improved upper bounds on independent sets and section 3 clique independent sets are studied.

A clique graph  $K_G(G)$  of  $G$  is a graph with vertex set as cliques of  $G$  and any two vertices in  $K_G(G)$  are adjacent if and only if the corresponding cliques in  $G$  have a vertex in common. Independence graph  $I_G(G)$  is a graph with vertex set as set of all maximal independent sets of  $G$  and any two vertices in  $I_G(G)$  are adjacent if and only if the corresponding independent sets have a vertex in common. The minimum order of partition of vertex set into independent sets is the chromatic number  $\chi = \chi(G)$ . Since independent sets and cliques exchange their properties on complementation, we have  $K_G(\overline{G}) \cong I_G(G)$ ,  $\theta_0(G) = \chi(\overline{G})$ ,  $\omega(G) = \beta_0(\overline{G})$  and  $\mathcal{G}(G) = i(G)$ .

## 2 Improved Bounds on Independence number

There has been an increasing interest in the study of independence number of graphs and several bounds were obtained - see, for instance, [6, 7, 8, 11]. Our interest in this paper is to get better bounds for independence number of a graph  $G$  using existing or some newly defined graph parameters. Sampathkumar and Pushpalatha [19] proved that  $\beta_0(G) \leq q$ . This bound is very weak in the sense that equality occurs if and only if  $G$  is isomorphic to only one family of graphs, viz the star graphs  $K_{1,n}$ . This bound is drastically improved by Pepper [15] who introduced another parameter called the *annihilation number*  $a(G)$  defined as the largest  $k$  such that  $\sum_{i=1}^k d(v_i) \geq \sum_{i=k+1}^n d(v_i)$  where  $d(v_i)$  are arranged in nondecreasing order. It is proved that  $\beta_0(G) \leq a(G) \leq \frac{k+1}{\delta} q$ . We now characterize the graphs for which  $\beta_0(G) = \frac{q}{\delta}$ .

**Proposition 1.** For any graph  $G$ ,  $\beta_0 = \frac{q}{\delta}$  if and only if  $G$  is either a regular bipartite graph or a complete bipartite graph.

*Proof.* Suppose that  $t = \beta_0 = \frac{q}{\delta}$  so that  $t\delta = q$  and  $S$  be any  $\beta_0$ -set of  $G$ . Then the  $t$  vertices in  $S$  cover all the edges and hence  $S$  is a vertex cover of  $G$ . Therefore  $V - S$  is an independent set of  $G$ . Thus  $G$  is a bipartite graph. Further, as every vertex in  $S$  is incident on  $\delta$  edges, every vertex in  $S$  is of degree  $\delta$ . If every vertex in  $V - S$  is of degree  $\delta$  then  $G$  is a  $\delta$ -regular bipartite graph. If  $G$  is not a regular graph then we claim that every vertex in  $V - S$  is of degree  $\Delta$ , for otherwise, every vertex in  $S$  cannot be of degree  $\delta$ . Then  $G$  is a  $K_{\delta,\Delta}$  complete bipartite graph. The converse is trivial.  $\square$

A hyper cube  $Q_n$  is a  $n$ -regular bipartite graph with  $2^n$  vertices and  $n2^{n-1}$  edges. From the above proposition we obtain the independence number of any hypercube.

**Corollary 2.** For any hypercube  $Q_n$ ,  $\beta_0(Q_n) = 2^{n-1}$



*Proof.* Since  $Q_n$  is a regular bipartite graph, from the Proposition 1, we have  $\beta_0(Q_n) = \frac{q}{\delta} = \frac{n2^{n-1}}{n} = 2^{n-1}$ .  $\square$

## VE-Degree

Several degree concepts are introduced in, [2, 11, 12]. Let  $N(v) = \{u \in V \mid u \text{ is adjacent to } v\}$  and  $N[v] = N(v) \cup \{v\}$ . Then  $\langle N[v] \rangle$  denote the subgraph induced by the set  $N[v]$ . The ve-degree of a vertex  $u \in V$ ,  $d_{ve}(u)$  = number of edges in  $\langle N[u] \rangle$ . Then  $\Delta_{ve} = \Delta_{ve}(G)$  and  $\delta_{ve} = \delta_{ve}(G)$  represent the maximum ve-degree and minimum ve-degree of  $G$  respectively. It is proved that  $\sum_{u \in V} d_{ve}(u) = 2q + 3t$  where  $t$  is the number of triangles in  $G$ . A vertex  $v \in V$  is *uniclqual* if  $v$  is incident on a single clique, otherwise  $v$  is *polyclqual*. Every cut vertex is a polyclqual vertex but not conversely. An edge  $x \in E$  is *uniclqual* if  $x$  is contained in a single clique, otherwise  $x$  is a *polyclqual edge*. For example, every edge of the corona  $K_m \cdot K_n$  is uniclqual where as the spokes (the edges joining the center) of a wheel  $W_n$  are biclqual. Under certain conditions, we show that the bound  $\beta_0 \leq \frac{p}{q}$  can be further improved using minimum ve-degree  $\delta_{ve}$ . First, we prove the following

**Lemma 3.** *Let  $S$  be any maximum independent set of  $G$ . If every edge of  $G$  is uniclqual, then for any two vertices  $u, v \in S$ ,  $\langle N[u] \rangle$  and  $\langle N[v] \rangle$  are edge disjoint.*

*Proof.* Let, if possible for any two vertices  $u, v \in S$ , there exists an edge  $x \in \langle N[u] \rangle \cap \langle N[v] \rangle$ . Then  $x \in \langle N[u] \rangle$  and  $x \in \langle N[v] \rangle$ . We observe that every clique in  $\langle N[u] \rangle$  is incident on the vertex  $u$ . Therefore  $x \in \langle N[u] \rangle$  implies that the edge  $x$  is contained in some clique say  $k_1$  incident on  $u$ . Similarly,  $x \in \langle N[v] \rangle$  implies that the edge  $x$  is also contained in some clique say  $k_2$  incident on  $v$ . Thus,  $x$  is a common edge contained in the cliques  $k_1$  and  $k_2$ . Hence  $x$  is a biclqual edge in  $G$  - a contradiction to the statement that every edge of  $G$  is uniclqual. This completes the proof of the Lemma.  $\square$

**Proposition 4.** *If every edge of  $G(V, E)$  is uniclqual then,  $\beta_0(G) \leq \frac{q}{\delta_{ve}}$ . Further, the bound is sharp.*

*Proof.* Let  $\beta_0 = t$  and  $S = \{v_1, v_2, \dots, v_t\}$  be a  $\beta_0$ - set of  $G$ . Let  $L_i$  be the set of edges ve-adjacent to the vertex  $v_i$ ,  $1 \leq i \leq t$  and hence  $|L_i| \geq \delta_{ve}$ . Since every edge of  $G$  is uniclqual, from the Lemma 3,  $\langle N[v_i] \rangle$  and  $\langle N[v_j] \rangle$  are edge disjoint for any  $1 \leq i, j \leq t$ ,  $i \neq j$ . Therefore  $L_i \cap L_j = \emptyset$  for any  $1 \leq i, j \leq t$ ,  $i \neq j$ . Further, there may be some edges which are not ve-adjacent to any  $v_i \in S$  and hence  $L_1 \cup L_2 \cup \dots \cup L_t \subseteq E$ . Thus  $q = |E| \geq |L_1 \cup L_2 \cup \dots \cup L_t| = |L_1| + |L_2| + \dots + |L_t| \geq t \delta_{ve}$  which yields the desired bound. The bound is sharp for any complete graph, complete bipartite graph or for any block graph in which every block has at least one noncutpoint.  $\square$

Another approach to improve the bound is considering cliques instead of edges. A clique which contains at least one uniclqual vertex is called a *monoclique* of  $G$ . We denote the set of all monocliques by  $K_{m_c}(G)$  and  $|K_{m_c}(G)| = m_c$ . Note that  $0 \leq m_c \leq k$  where  $k$  is the number of cliques in  $G$ .

**Proposition 5.** For any graph  $G$  with  $k$  cliques and  $m_c$  monoclques,

$$m_c \leq \beta_0 \leq k \quad (1)$$

Further,

i)  $\beta_0 = k$  if and only if every clique is a monoclque in  $G$

ii)  $\beta_0 = m_c$  if and only if there exists a maximum independent set  $S$  such that every vertex in  $S$  is a uniclqual vertex in  $G$ .

*Proof.* As we can pick at most one independent vertex from each of the cliques, the maximum number of independent vertices cannot exceed  $k$ . Thus  $\beta_0 \leq k$ .

Let  $\{k_1, k_2, \dots, k_{m_c}\}$  be the set of monoclques of  $G$  and  $S = \{u_1, u_2, \dots, u_{m_c}\}$  be the set of uniclqual vertices picked such that  $u_i \in k_i$   $1 \leq i \leq m_c$ . Since each  $u_i$  belongs to different cliques,  $S$  is an independent set. Hence  $\beta_0(G) \geq |S| = m_c$ .

To prove (i). If every clique is a monoclque in  $G$ , then each clique contribute one to the independent set and hence  $\beta_0(G) \geq m_c = k$ . We already have  $\beta_0(G) \leq k$ . Thus  $\beta_0(G) = k$ . Conversely, suppose that  $\beta_0(G) = k$ . Note that every vertex in any  $\beta_0$ -set belongs to different cliques. These two conditions together imply that each clique has atleast one uniclqual vertex. Hence every clique of  $G$  is a monoclque in  $G$ .

To prove (ii). This result follows from the fact that  $\beta_0(G) = m_c$  if and only if the set of uniclqual vertices taken one each from the monoclques of  $G$  forms a maximum independent set of  $G$ .  $\square$

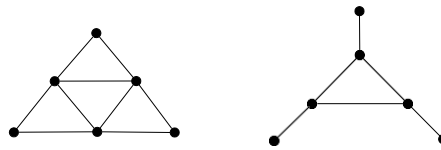


Figure 1: Hajo's Graph and its complement  $K_3 \cdot K_1$

For example, for any block graph  $G$  in which every block has at least one noncutpoint  $\beta_0(G) = m_c = k$ . Further, for the Hajo's graph and its complement  $K_3 \cdot K_1$  in Figure 1,  $\beta_0 = 3 = m_c < 4 = k$ .

## VC-Degree

We now define vc-degree of a vertex  $u$ ,  $d_{vc}(u)$  as the number of cliques incident on the vertex  $u$ . Then  $\Delta_{vc} = \Delta_{vc}(G)$  and  $\delta_{vc} = \delta_{vc}(G)$  denote the maximum and minimum vc-degree of  $G$  respectively. If  $u$  is an uniclqual vertex then  $d_{vc}(u) = 1$ . For any polyclqual vertex  $u$ ,  $d_{vc}(u) \geq 2$ . In many cases, it is found that the independence number is much smaller than the number of cliques  $k$ . Therefore we further refine the bound obtained in Proposition 5, using the minimum vc-degree  $\delta_{vc}(G)$ .

**Proposition 6.** For any graph  $G$ ,

$$\beta_0 \leq \frac{k}{\delta_{vc}} \quad (2)$$



Further, this bound is sharp.

*Proof.* Let  $\beta_0 = t$  and  $D = \{v_1, v_2, \dots, v_t\}$  be a  $\beta_0$ -set of  $G$ . Let  $S_i$  be the set of cliques incident on the vertex  $v_i$ ,  $1 \leq i \leq t$ . Therefore  $|S_i| \geq \delta_{v_i}$ . As no two vertices in  $D$  can be incident on the same clique, (for otherwise,  $D$  is not independent) the cliques incident at  $v_i$  are distinct from cliques incident at  $v_j$  for  $1 \leq i, j \leq t$ ,  $i \neq j$ . Further, there may be some cliques in  $G$  which are not incident on any of  $v_i \in D$  and hence,  $S_1 \cup S_2 \cup \dots \cup S_t \subseteq K(G)$ . Therefore  $k = |K(G)| \geq |S_1 \cup S_2 \cup \dots \cup S_t| = |S_1| + |S_2| + \dots + |S_t| \geq t\delta_{v_i}$  which yields the desired bound.  $\square$

One can check that the bound in the Proposition 6 is sharp for  $G = rK_n$  and for complete bipartite graph  $K_{m,n}$ . For any even cycle  $\beta_0(C_{2n}) = n = \frac{2n}{2} = \frac{k}{\delta_{v_i}}$ , and the bound is attained.

### 3 Clique Independent and Disjoint maximal Independent sets

The edge independence number  $\beta_1 = \beta_1(G)$  is the size of maximum edge independent set of  $G$ . A set  $L \subseteq K(G)$  is clique independent (CI-set) if no two cliques have a vertex in common. The clique independence number  $\beta_c = \beta_c(G)$  is the maximum number of cliques in a CI-set of  $G$ . Similarly, the minimum clique independence number  $\beta_{mc} = \beta_{mc}(G)$  is defined as the minimum order of a maximal CI-set of  $G$ . Note that the CI-set exists for any graph. It is immediate that  $\beta_{mc} \leq \beta_c \leq \beta_1$  and  $\beta_{mc} \leq \theta_0(G)$ . A graph  $G$  is clique partitionable if  $V(G)$  can be partitioned into maximal cliques of  $G$ . If  $G$  is clique partitionable, then  $\beta_{mc}(G) = \theta_0(G)$ .

We have the following dual definitions. Let  $I(G)$  denote the set of all maximal independent sets of  $G$ . A set  $L \subseteq I(G)$  is disjoint maximal independent (DI-set) if no two maximal independent sets have a vertex in common. The disjoint independence number  $\beta_i = \beta_i(G)$  is the maximum order of a DI-set of  $G$ . Similarly, the minimum disjoint independence number  $\beta_{mi} = \beta_{mi}(G)$  is defined as the minimum order of a maximal DI-set of  $G$ . Note that the DI-set exists for any graph. It is immediate that  $\beta_{mi} \leq \beta_i$  and  $\beta_{mi}(G) \leq \chi(G)$ . A graph  $G$  is indominable if  $V(G)$  can be partitioned into maximal independent sets. A graph  $G$  is indominable, then  $\beta_{mi}(G) = \chi(G)$ . The independent sets are also studied in literature by removing the condition of maximality. In chemical graph theory, the maximum number of independent sets (not necessarily maximal) in a graph is referred as Merrifield-Simmons index [13] and its edge analogue the maximum number of edge independent sets as Hosoya index [10]. However we restrict ourselves in this paper the study of disjoint maximal independent sets. Recently, Derikvand and Oboudi [4] partially attempted to find the number of maximum independent sets of a graph. Erdos et. al [14] obtained the following lower bounds on clique independence number and minimum clique independence number.

**Proposition 7.** [14] For any graph  $G$  with  $p$  vertices and maximum degree  $\Delta$ , then,

$$\beta_i(G) \geq \frac{6p}{(\Delta+3)^2} \quad (3)$$

$$\beta_{mi}(G) \geq \frac{4p}{(\Delta+2)^2} \quad (4)$$

We now show that the clique independence number serves as a lower bound for independence number.

**Proposition 8.** For any graph  $G$ ,

$$\beta_c \leq \min\{\beta_0, \beta_1\} \quad (5)$$

$$\beta_{mc} \leq \min\{i(G), i'(G)\} \quad (6)$$

*Proof.* We already have  $\beta_c \leq \beta_1$ . Therefore it suffices to show that  $\beta_{cc} \leq \beta_0$ . Let  $\beta_c = t$  and  $L = \{k_1, k_2, \dots, k_t\}$  be the  $\beta_c$ -set of  $G$ . Since each  $k_i$  is clique-independent, we can select a vertex  $v_i$  incident on each clique  $k_i$  in  $L$  such that  $L_1 = \{v_1, v_2, \dots, v_t\}$  is an independent set of vertices. Thus  $t = \beta_c = |L| \leq |L_1| \leq \beta_0$ . Then the result follows. The result (6) can be proved similarly.  $\square$

The following proposition is obtained in [20]

**Proposition 9.** [20] For any graph  $G$ ,

$$\beta_c \leq \frac{p}{g} \quad (7)$$

Further,  $\beta_c = \frac{p}{g}$  if and only if  $V(G)$  can be partitioned into maximal cliques of minimum order.

We state the similar result for minimum clique independent sets without proof.

**Proposition 10.** For any graph  $G$ ,

$$\beta_{mc} \leq \frac{p}{\omega(G)} \quad (8)$$

and equality occurs if and only if  $V(G)$  can be partitioned into maximal cliques of maximum order.

**Proposition 11.** For any graph  $G$ ,

$$\beta_0(G) \leq \frac{p}{\beta_{mi}(G)} \quad (9)$$

$$i(G) \leq \frac{p}{\beta_i(G)} \quad (10)$$

*Proof.* Since disjoint independent sets and clique independent sets exchange their properties on complementation, we have  $\beta_i(G) = \beta_c(\overline{G})$  and  $\beta_{mi}(G) = \beta_{mc}(\overline{G})$ . Then from Proposition 10, we have  $\beta_{mi}(G) = \beta_{mc}(\overline{G}) \leq \frac{p}{\omega(\overline{G})} = \frac{p}{\beta_0(G)}$  which yields the desired result (9). Similarly, the result (10) can be proved using Proposition 9.  $\square$

## Well Clique Covered Graphs

In 1970 Plummer [16] introduced the concept of well covered graphs and further studied in [17] and [18]. A graph  $G$  is *well covered* if  $i(G) = \beta_0(G)$ . The above definition of well covered graphs motivates to define another class of graphs called well clique covered graphs. A graph  $G$  is *well clique covered* if every maximal clique independent set is of same order. Equivalently, a graph  $G$  is well clique covered if  $\beta_c(G) = \beta_{mc}(G)$ . We now provide a characterization of well clique covered graphs.

**Proposition 12.** *A graph  $G$  is well clique covered if and only if  $\overline{K_G(G)}$  is clique regular.*

*Proof.*  $G$  is well clique covered  
 $\Leftrightarrow$  every maximal clique independent set in  $G$  is of same order  
 $\Leftrightarrow$  every maximal independent set in  $K_G(G)$  is of same order  
 $\Leftrightarrow K_G(G)$  is well covered  
 $\Leftrightarrow$  every maximum independent set in  $K_G(G)$  is of same order  
 $\Leftrightarrow$  every clique in  $\overline{K_G(G)}$  is of same order  
 $\Leftrightarrow K_G(G)$  clique regular. □

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## PARSI COMMUNITY AND THE MODERNITY CHALLENGES: A DIALOGUE WITH THE INSIDERS

Vincent Alva

### Abstract

*The Parsi community is one of the most successful minority and migrant groups in the world. In India this small migrant community gave a newer edge to banking and business. Parsis such as Tata, Godrej, Wadia families and others are among India's top business dynasties. Their influence on Indian economy is unmatched. But this small community remained small and even is facing the fear of extinction in India. With their unique and rare rituals and culture they remained always away from the mainstream. Their social and religious practices always made them remain foreigners though they were the citizens of the country in which they were living. It was easier for them to identify themselves with the colonial masters than the colonised. This also became one of the reasons for their aloofness. The strict family customs and caste barriers they followed never allowed them to associate with other castes. They never allowed their members to marry a person outside the caste. This is one of the major reasons for the dwindling number of Parsis in India. The plight of the Parsis has been a subject for literature. Particularly, being a Parsi himself, Rohinton Mistry has extensively dealt with the predicament of Parsis in India in his fictional works. This research article is an attempt to analyse the subtleties of Parsi community in the light of Mistry's novel Family Matters.*

**Keywords:** colonialism, modernity, inter-caste marriage, tradition, religious fanaticism.

Modernity has not left anyone untouched. Individuals, institutions as well as communities have come under its sway. There has been an enormous change in everyone and everything concerned due to its impact. The modernity that came to India through the colonial vehicle got rooted so deep that every walk of life came under its influence.



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**Development of Indian Classical Language and Literature on Modern  
Creative Writing of India**

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**Abstract**

Language is a medium through which we express our thought. While the literature is a mirror which reflects ideas and philosophies which govern our society, hence to know any particular culture and its traditions it is very important we understand the evolution of its language and the various forms of literature like poetry, plan drama, religious and non religious writing.

Indian language play a very important role in our culture and one of the earliest language is Sanskrit ever since human being have invented scripts, writing has reflected the culture, life style, society and the polity of the contemporary society. Each culture evolved its own language and creates a number of literary bases and this literary base of civilization tells us about the evolution of its language and culture through the span of centuries.

As we know Sanskrit language is a mother of most of the Indian language .The Vedas and Puranas, Mahabharata, Ramayana all these works were written in Sanskrit language and also variety of secular and regional literature created in the past so that we can understand better. It is among the 22 language listed in the Indian Constitution .Sanskrit gave importance to study linguist scientifically during 18<sup>th</sup> and 19<sup>th</sup> century.

Sanskrit is the only language that transcended the barriers of regions and boundaries from the north to the south and east to the west .There is no part of India that has not contributed to all being affected by language.

**Keywords:** Sanskrit, language, Mahabharata, Ramayana, Vedas, Puranas.

  
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## **Role of Edu-warriors in Higher Education Wellness during COVID 19: An Analysis**

**Dr. Vijaya Kumar <sup>1</sup>**

**Dr. Ganesh Bhat. S. <sup>2</sup>**

### **Abstract**

*COVID 19 has become Pandemic of Mass Distraction (PMD) that thrown the higher education out of gear worldwide. Fortunately, the powerful constituent of Corona Warriors - the scientific community - has invented the vaccine that may restore the societal health equilibrium in the immediate near future. In this hindsight, shedding the infection-fear from mind-space of Edu-warriors for resurrection of higher education is much sought after to cater to the needs of society inter alia the corporate sector. This paper makes an impressionistic assessment of changing role expectations of Edu-warriors - institutional leadership, the faculty members, student and parent community, and the society at large - in recouping time lost for 'quality edu-service delivery' during PMD. It is argued that Edu-warriors - can be noted a team disconnected from normalcy and yet asked to achieve the main goal with hands tied - exhibited right calibre to meet the mutual role demands of different stakeholders: institutional leadership, teachers, students, parents, funders, employer community, the State and society at large.*

**Key words:** Edu-Warriors, Higher Education Wellness, COVID -19

### **Introduction**

These days, when the term 'Vidyadaana' turned outmoded and 'Vidya' can be secured at a price, ensuring quality education receives significance. For instance, the "FICCI Vision 2030 for Higher Education in India" outlines Higher Education Infrastructure that would create high quality, yet equitable and affordable Indian Higher Education System. Educational Service quality can be ensured when: one, the educational administrators (the management, the university and the government) show

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