

Virtual Teams and Its Impact on The Competitive Advantage of Companies An analytical study on the research and development department of some international companies

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ABSTRACT

This research aims to study the role of virtual teams(VTs) in improving and increasing the innovation process and gain valuable input from research and development department (R&D) of the international companies under study (SAMSUNG, LG, NISSAN, TOYOTA, and IBM), how virtual R&D team can play a prominent role in developing innovation that reflects on achieving a stronger competitive advantage for these organizations.

The research found that hypothetical teams are considered one of the important modern means in business organizations today, due to the increase in response and the shift from serial work to simultaneous and parallel work to increase innovation, which in turn led to increasing the competitiveness of these organizations.

Key words:- virtual teams(VTs) ,research and development department (R&D) , innovation , competitive advantage.

I. INTRODUCTION

In today's organizations, especially those that extend across countries. competitive pressures and rapid development of information technology and means of communication ,In response to these challenges, in addition to the challenges of globalization, virtual teams are appeared, those teams that eliminate all temporal and spatial boundaries and benefit from the forces of diversity, both in terms of skills, experiences, and knowledge throughout the world.

Hence the research questions that the researcher tried to formulate through These questions:

Q1: Are virtual teams a competitive advantage for organizations that depend on them?

Q2: Does cultural diversity, multiple experiences, skills, and knowledge within virtual teams lead to increased innovation and creative ideas in developing new products or developing business methods?

Q3: Have virtual teams become an important base that cannot be overlooked when doing business and managing innovation?

Q4: What are the challenges facing organizations to prepare virtual teams and how to face them?

Theoretical framework

Understanding virtual teams

In today's business environment, organizations adapt quickly or break down. Get competitive advantage in a global environment means continually Reforming the organization to maximize strengths, address threats, and increase speed (Duarte & Snyder ,2001). Virtual teams represent one such organizational form, one that could revolutionize the workplace and provide organizations with unprecedented levels of flexibility and responsiveness (Ebrahim . et al ., 2009) . VT afford many advantages to organizations, including increased knowledge sharing and employee job satisfaction and commitment, as well as improved organizational performance (Pauleen, 2003) .

Defining virtual teams

The term of virtual team(VT) can be define in defferent ways, Ebrahim et al. (2009) defined VT as small temporary groups of geographically, organisationally and/or time-dispersed knowledge workers who coordinate their work predominantly with electronic information and communication technologies to accomplish one or more organisational tasks, Kayworth & Leidner (2002) describe VTs are composed of coworkers geographically and organizationally linked through telecommunications and information technologies attempting to achieve an organizational task. (Kimble, 2011) Classified VT to a number of different types of groups.Team membership may be relatively stable , Members may be drawn from the same organization or from several different organizations , Team members may work in close proximity , or geographically distantly , and, similarly, team members may work at the same or at different times ,In onther hand (Zuofa& Ochieng,2017) described VTs as groups of geographically and/or administratively dispersed co-workers who are linked by means of telecommunication and information technologies to accomplish set

organizational objectives .In contrast, (Morley et al., 2015) state that the term ‘VT can just as easily be applied to groups of people who work no more than 50 feet apart. Distributed work across different locations and/or working times is not a phenomenon of the last 15 years only. According to (Hanisch ,2001) VT are characterised by members who are physically isolated, who interact mainly through the use of electronic communication technologies and who rarely or never meet face-to-face . They are said to be functional units of an organisation which are flexible, and which both quickly and professionally “execute multiple projects, anywhere and anytime”. These teams are characterised by short-term (i.e., 6 months) project based work and by their nature virtual teams lend themselves to ad hoc teams or “task-force” work groups which come together for specific project objectives and disband once these have been fulfilled .

As a minimal consensus, (Hertel et al., 2005) Summarize the definition of VTs is two or more persons who collaborate interactively to achieve common goals, while at least one of the team members works at a different location, organization, or at a different time so that communication and coordination is predominantly based on electronic communication media (email, fax, phone, video conference, etc.)

In other hand (Tan,2019), (Gera , 2013) explained the comparisons between face to face and virtual teams on the basis of styles, performance, satisfaction, trust, cohesion and conflicts. found that only five factors had affected the performance of virtual teams, the factors are relationship building , cohesion ,Trust ,communication and coordination

Importance of Virtual Teams

VTs have become important as organizations operate in dispersed geographic contexts where organizations need to increasingly draw on work processes not confined to one immediate geographical locale, and expertise in different parts of the world (Cascio, 2000), based on the report of the RW3 Culture Wizard 2016 * prepared by 1372 people, customers, end users and business companies working in the field of global commercial activity in 80 countries to know and study the importance and role of VTs in improving the performance of organizations, who emphasized the importance of VTs and increase their spread within most International organizations, where 41% of the global number of workers are virtual workers who do not meet with each other personally, and that 48% of respondents confirmed that more than half of their teams are members from other countries, and the report confirmed that these numbers are greater Than in 2014.

In the competitive market , VTs represent a growing response to the need for fast time-to-market, low-cost and rapid solutions to complex organizational problems. VTs enable organizations to pool the talents and expertise of employees and non-employees by eliminating time and space barriers . Nowadays companies are heavily investing in VT to enhance their performance and competitiveness (Ebrahim . et al ., 2009) , A report from the Economist Intelligence Unit(2009) , of the 407 people in the initial sample, nearly eight out of ten (78%) work in a VT or have worked in a VT in the recent past. Of the 22% who do not currently work in a VT, one in four say that they expect to do so in the near future. The most commonly cited reason for not working in a virtual team is that the organisation is simply not geographically dispersed(Carson, et al .,2007).

VTs help global firms to use the best talent wherever it is located. The global search for talent must also include ideas from other nations and cultures (Davis, 2004) VTs have particularly strategic advantages. For instance, they can be staffed based on members’ expertise instead of their local availability. They can also work around the clock by having team members in different time zones, increasing the speed and flexibility with which they can respond to market demands. Closer relations with customers can be achieved and travel expenses can be reduced . The arena in which firms compete for resources now encompasses the whole world . For example, Lasser and Heiss (2005) report that Siemens, the large German electronic systems and components producer, handles more than 1,000 projects in a distributed mode – that is, with teams dispersed all over the world. The strategic structure of the virtual work team provides the flexibility to cope with environmental changes. It is therefore no surprise that organizations are increasingly relying on VTs to carry out their activities, including design, production, and logistics (Drouin , 2009)

A review of current literature done by Powell et al. (2004), they found that several studies have summarized the contributors to the successful performance of VTs training, strategy or goal setting, developing shared language, team building, team cohesiveness, communication, coordination and commitment of the team, the appropriate task-technology fit and competitive and collaborative conflict behaviors (Tan,2019, Dulebohn & Hoch , 2017& Martins, 2011) explain that VTs allows companies to access a pool of talent worldwide, thus selecting the most qualified individuals for a team. They can be used to shorten product-to-market cycles through 24-h productivity and lowering costs by reducing travel, relocation and overhead, and sharing knowledge across geographic boundaries and organizational units and sites.

Challenge Of Whereas Global Virtual Teams

undoubtedly the VTs face similar challenges as traditional teams, we argue that these dispersed work groups may also face unique issues. This stems from the belief that the CMCS (such as, desktop video conferencing systems, e-mail, group support systems, internets, and intranets) used to link team members across

time, space, and organizational boundaries represent fundamentally new types of mediums “with their own advantages, disadvantages, social dynamics, problems, and opportunities” (Kayworth & Leidner 2002), one of the most challenge it can be more difficult to achieve shared understanding in VTs (Cristina, 2003). Building and maintaining virtual employee identity in modern organizations is a new challenge: human resource management must resonate with virtual knowledge workers, and deal with unique issues such as visibility in the organization, career options, and paths to advancement. Virtual staff need to feel they are on a par with other workers in the organization and that their different personal and work circumstances are understood. Human resource management must overcome the perceived natural advantage of in-house employees, with possible implications for organizational design. Lack of a sense of belonging can show up in human resource indicators, such as low morale and retention. (Asian Development Bank), Members of VTs may have difficulty getting promoted as they have fewer opportunities for face-to-face networking efficient monitoring and measurement of employee performance therefore remains problematic (Marks and Lockyer, 2005). In addition to Few companies provide training in working virtually (Davis, 2004). (Powell, 2004) emphasized that there are virtual team studies have examined the role of cultural differences among team members. Cultural differences appear to lead to coordination difficulties such as (Johansson et al., 1999; Kayworth & Leidner, 2000; Maznevski & Chudoba, 2001; Robey et al., 2000), and create obstacles to effective communication (Cristina, 2003). Cultural and language differences are common in global virtual teams. But subtler differences among team members from different regions of the same country may be enough to negatively impact a virtual team. The negative effect of cultural differences may be mitigated by an effort to actively understand and accept the differences, Leadership VTs have a set of leadership challenges, especially regarding the important team results and performance. Virtual team leaders face a set of daunting problems that are not seen in many traditional team settings – such as having to adapt to cultural, geographic and time differences and helping employees adjust to virtual work roles and structure (Ziek, 2012 & Watanabe, 2017).

some researchers have found that conflict is more likely to occur in virtual contexts partly due an increased difficulty in achieving goal alignment and goal commitment. so it is the important to creating a shared context by focusing on early experiences within the team by focus on key processes such as goal setting and role clarification. (Pazos, 2012).

innovation and competitive advantage

intense and rapid competitive moves require firms to continuously innovate to create new advantages, Innovation in firms has been linked with competitiveness and is considered a necessary strategic tool for firms wanting to remain competitive and relevant. Innovation is also seen as an important tool for competitiveness in the modern business environment characterised by hyper-competition. The survival of firms has been thought to depend on the firm's ability to gain competitive advantage through innovation that requires flexibility, adaptability and responsiveness. It is suggested that an organisation's propensity to innovate is a type of dynamic capability that contributes to competitive advantage (Dorson, 2018), Innovation is the creation of a new product-market-technology organization-combination (PMTO-combination). This definition suggests that there are three key elements: Innovation is a process and should be managed as such Key activities in innovation management are: goal formulation, designing and organizing the process, monitoring progress and, if necessary, adjusting the goals, the process and/or its organization (Boer & During, 2001). According to (Zawawi, 2016) innovation is “an organizations' overall innovative capability of introducing new products to the market, or opening up new markets, through combining strategic orientation with innovative behavior and process”. (Goyal & Pitt, 2007) examined the type of innovation, these can be product innovation, process innovation, organizational innovation, management innovation, production innovation, marketing innovation and service innovation.

Competitive advantage lead to address some of the criticisms of comparative advantage, (Porter, 1985) emphasized Competitive advantage is the firm's ability to create a defensive position against their competitors. It is a key element of a firm that is used to measure and differentiate the firm from its competitors and on-time delivery, competitive price/cost, high quality, correct quantity and flexibility are known to be the crucial measures (Abeysekara, 2019), (Christensen, 2010) defined Competitive advantage is “whatever value a business provides that motivates its customers (or end users) to purchase its products or services rather than those of its competitors and that poses impediments to imitation by actual or potential direct competitors”, (Foss & Knudsen, 2003) on the other hand, defined Competitive advantage is the “strictly positive differential profits in excess of opportunity costs that are sustained in equilibrium, where the relevant differentials may be inter-industry as well as intra-industry”.

Relation between virtual team, innovation & competitive advantage

Products are being every day gaining the right knowledge for keeping pace with the rate and intensity of change has become an inevitable necessity. VTs provide an environment for flourishing innovation in R&D and bring about knowledge spillovers within enterprises bridging time and place, therefore the decision on setting up virtual teams in R&D is not a choice but a requirement. The globalization of and the new waves of global trends

in business along with advances in telecommunications technology have blaze a trail for the formation and the performance of VTs. (Ebrahim, et al., 2009)*, Able to tap selectively into center of excellence, using the best talent regardless of location (Samarah, Paul, & Tadisina, 2007) Greater productivity, shorter development times (Mulebeke & Zheng, 2006), Producing better outcomes and attract better employees, Generate the greatest competitive advantage from limited resources. Better team outcomes (quality, productivity, and satisfaction) May and Carter (2001) explain the case study of VT working in the European automotive industry have shown that used communication and collaboration between geographically distributed engineers at automotive manufacturer and supplier sites make them get benefits are better quality, reduced costs and a reduction in the time-to-market (between 20% to 50%) for a new product vehicle (Leenders et al., 2003). In addition, The use of VTs for new product development is rapidly growing and organizations can be dependent on it to sustain competitive advantage (Ebrahim, et al., 2009)

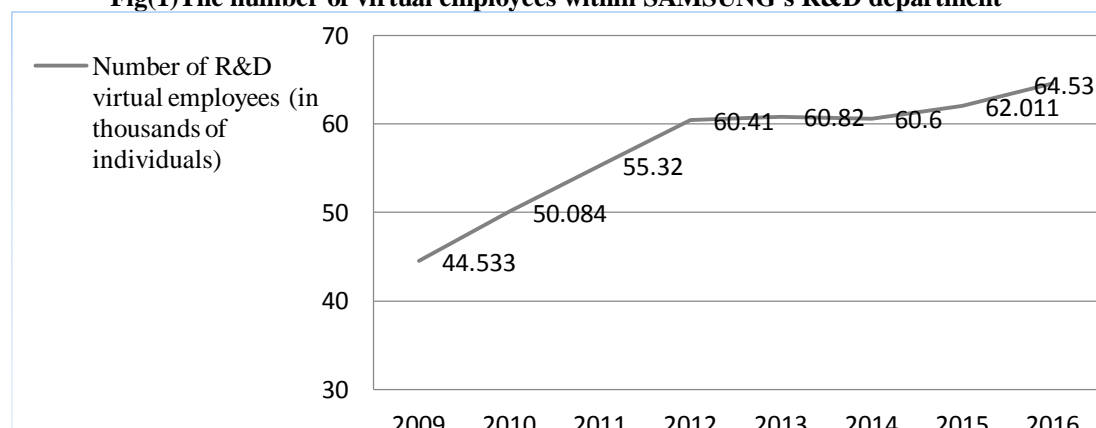
II. RESEARCH METHODOLOGY

1-Data and sample... The researcher dependent on the researcher's available references, published research and the Internet with the aim of defining the problem's framework and setting the conceptual framework for it and presenting previous studies, in addition to relying on financial data whether budgets, the number and size of innovations, the number of hypothetical employees, the costs and profits of a department Research and development of the organizations under study (SAMSUNG, LG, NISSAN, TOYOTA, IBM),, which have been published in the official reports of these organizations and the analysis of these data and numbers in order to obtain results that serve the primary purpose for which this research was established.

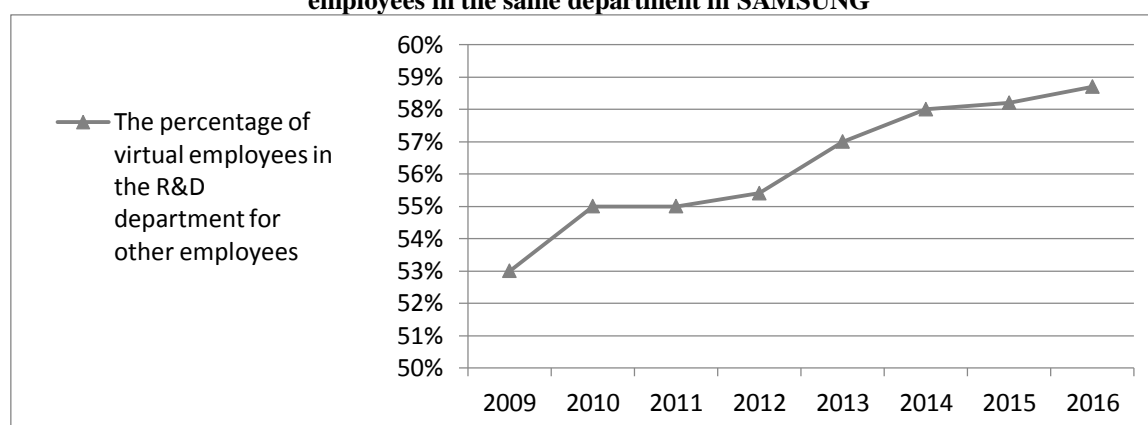
1- The data of SAMSUNG company

These following data are shown the relation between number of virtual employees within the R&D, the amount of spending (investment) and The volume of sales

Fig(1)The number of virtual employees within SAMSUNG's R&D department

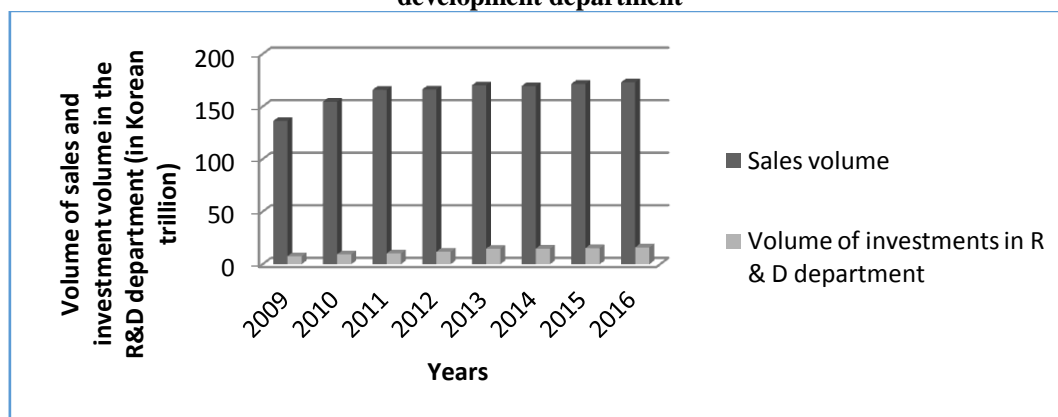


Fig(2)The percentage of the number of virtual employees within the R&D department compared to other employees in the same department in SAMSUNG

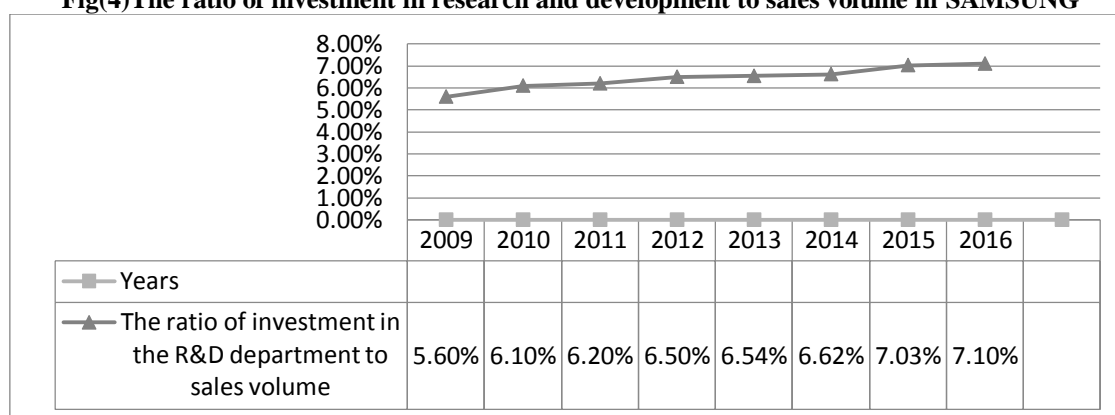


The number of virtual employees and their ratio to the number of traditional employees, it is clear that the number of employees is constantly increasing, as in 2009 44533 employees to 64540 employees in 2016, a ratio of 53 % To 58% as shown in Figure (1), (2)

Fig(3)The volume of sales in Samsung and the amount of spending (investment) within the research and development department



Fig(4)The ratio of investment in research and development to sales volume in SAMSUNG



In Figure (3) and (4) it is clear that with the increase in the proportion of investment in the R&D department, there is a noticeable increase in the volume of sales, meaning that there is a direct relationship between the volume of sales and investment in the R&D department of the company.

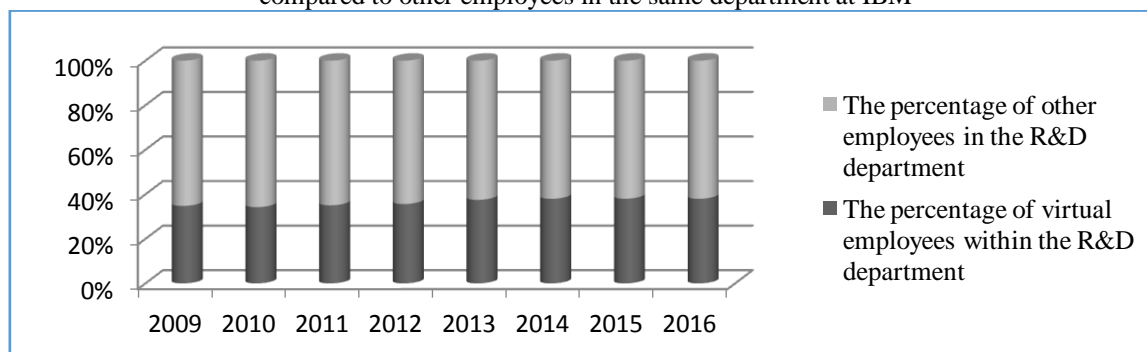
Number of innovation at SAMSUNG

Samsung Electronics is famous for its innovation, and received 30 Innovation Awards at the Consumer Electronics Show in 2012, which is the largest consumer technology trade fair. The company focuses on continuous growth and hopes to become a leader in the global IT industry.

The number of future technology and product innovations increased in 2014, with 952.4 patents registered, as a result of nearly 15 trillion Korean yen invested in the R&D department to lead industry innovation, expand global R&D centers and recruit top talent. , Which is the world record number 2. In 2016 she won 38 international creative awards in the field of consumer electronics. 100 patents filed in addition to the record set in 2014.

2- The data of IBM company

Fig(5)The percentage of the number of virtual employees within the Research and Development division compared to other employees in the same department at IBM



The percentage of the number of virtual employees within the Research and Development division compared to other employees in the same department is constantly increasing from 53 % To 61.30% as shown in Figure (5).

Fig(6)The volume of sales at IBM and the amount of spending (investment) within the Research and Development Division

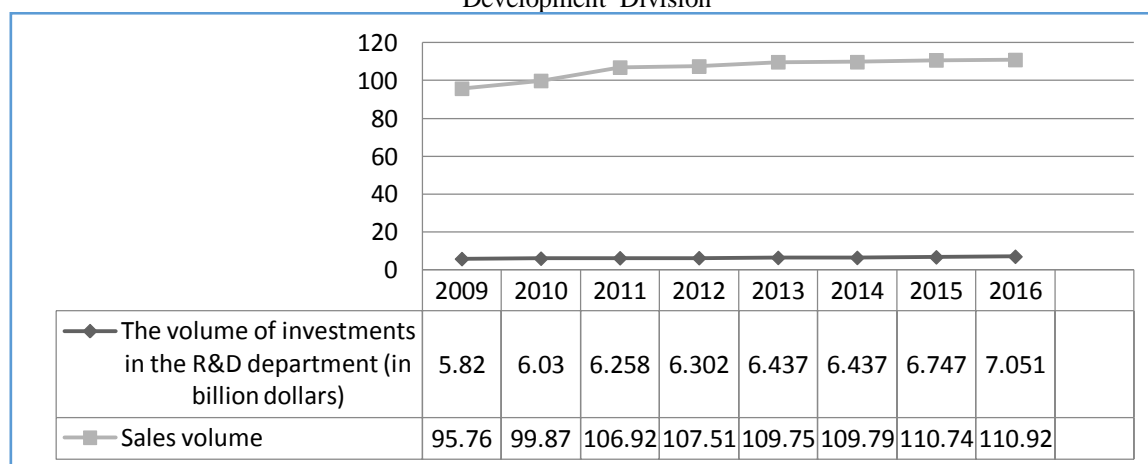
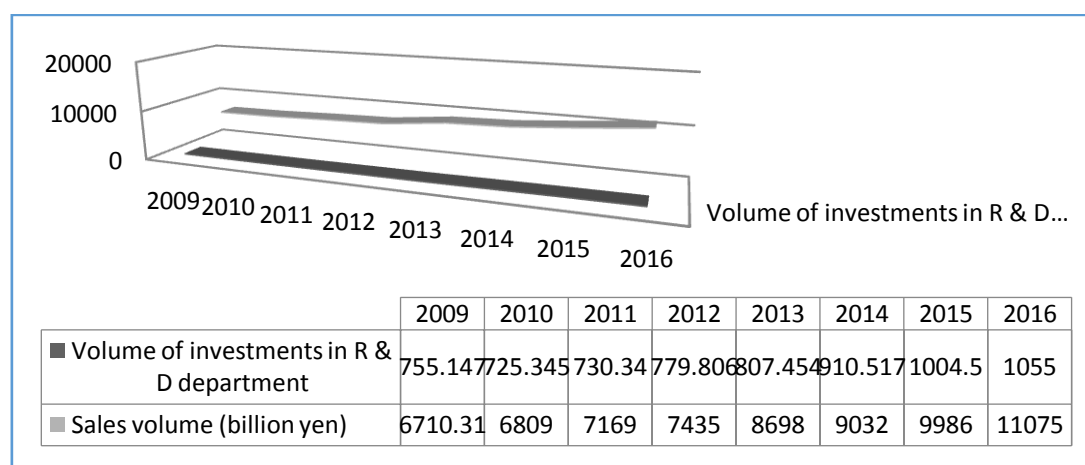
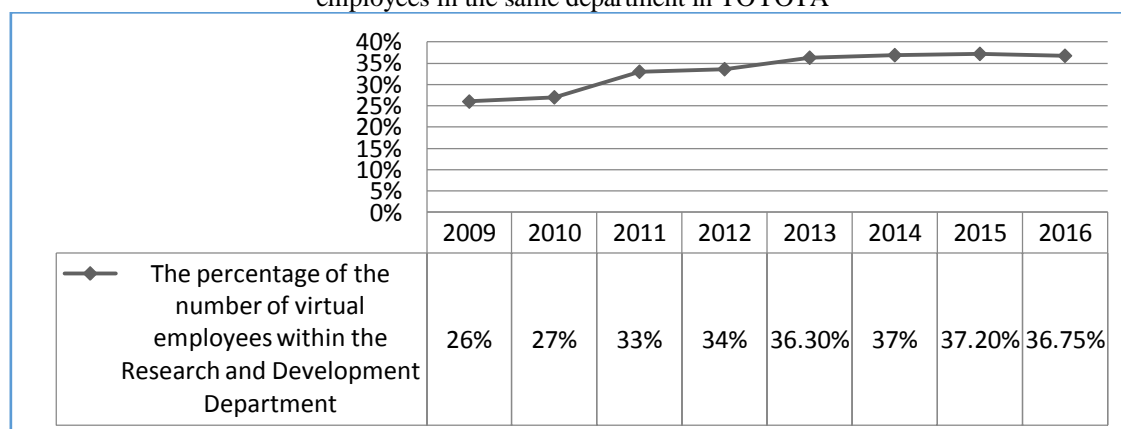


Figure (6) is shown that there is a direct relationship between the volume of sales and investment in the R&D department of the company and this relation is positive because when investments in the R&D in 2009 is 5.82 is increased to 7.051 billion dollars in 2016 . in the same way the sales volume in the R&D is increased from 95.76 to 110.921 billion dollars in the same years

3- The data of TOYOTA company

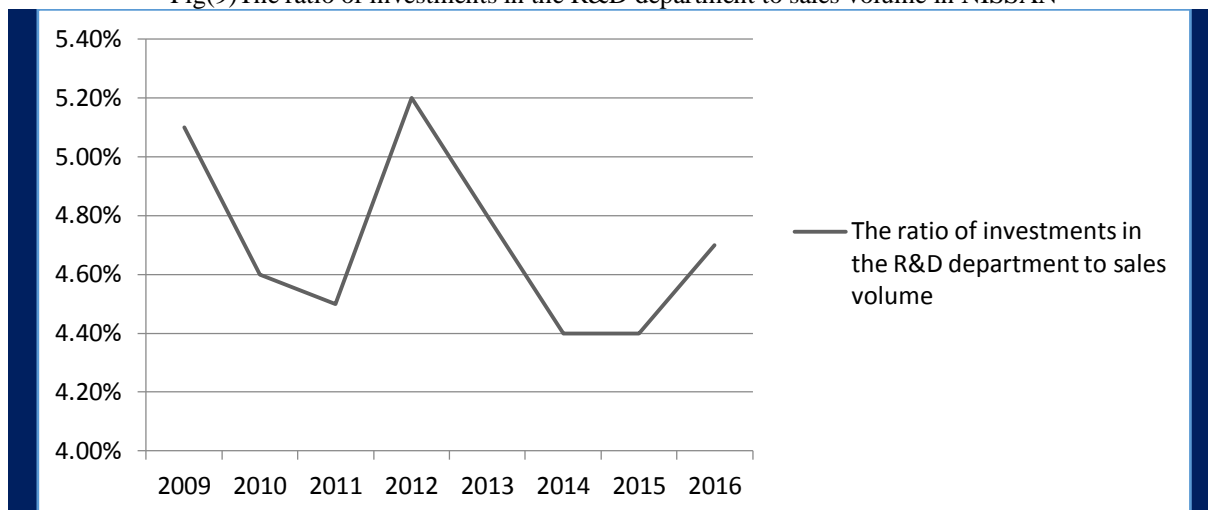
Fig(7)The percentage of the number of virtual employees within the R&D department compared to other employees in the same department in TOYOTA



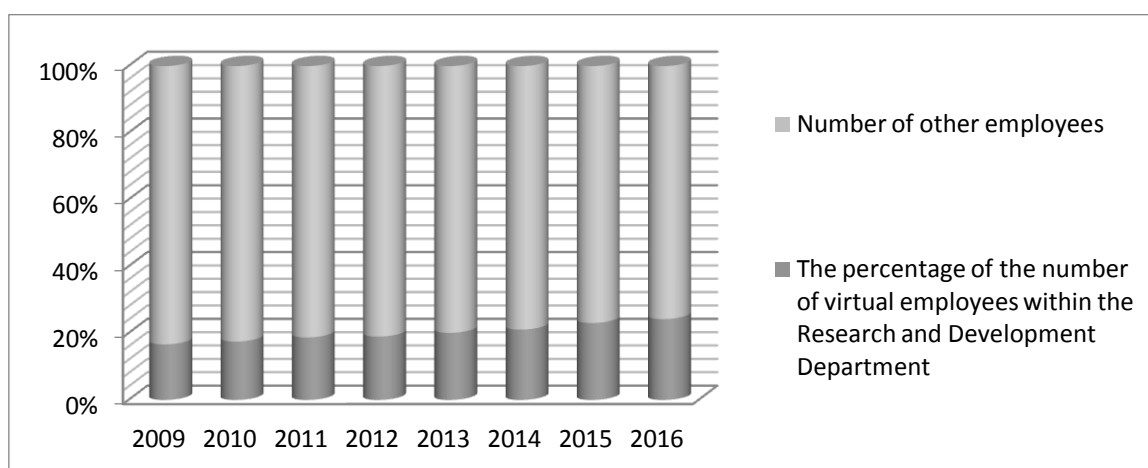
Fig(8)The volume of sales in TOYOTA and the amount of investments spent within the R&D department

4- The data of NISSAN company

Fig(9)The ratio of investments in the R&D department to sales volume in NISSAN

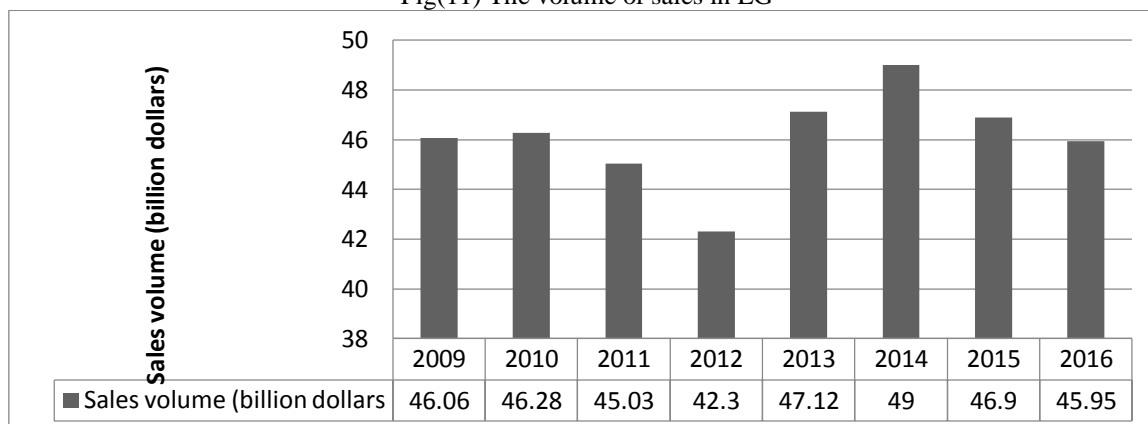


Fig(10)The ratio of the number of virtual employees within the R&D department relative to other employees in the same department at NISSAN

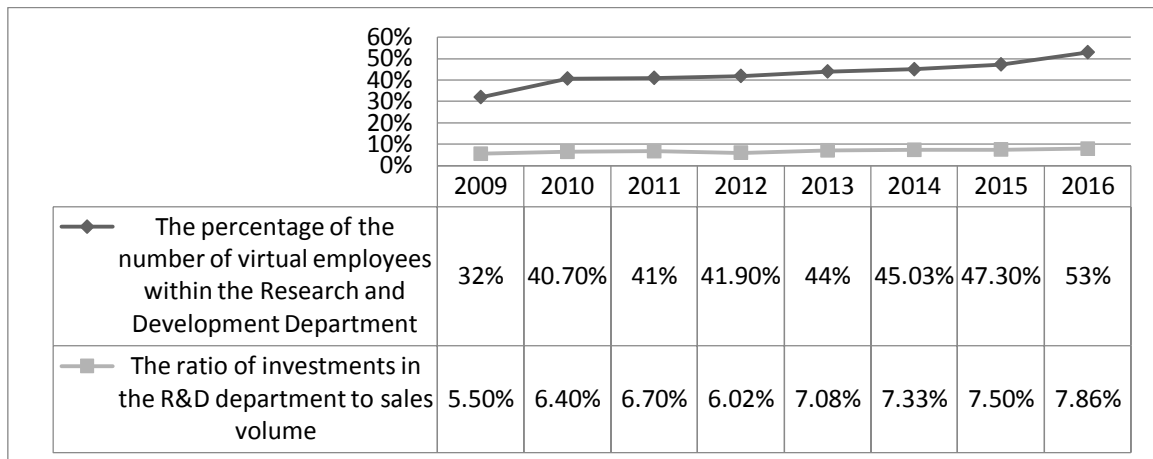


5- The data of LG company

Fig(11) The volume of sales in LG



Fig(12) The ratio of the number of virtual employees within the R&D department in relation to other employees in the same department at LG and the ratio of investments in the R&D department to the sales volume at LG



2-General analysis of company data

Based on the previous financial data in all companies, there is a strong and direct relationship between the volume of the investment in the R&D department, the volume of sales, and the increase in the number of virtual employees in the same department.

III. DISCUSSION AND CONCLUSIONS

Despite the challenges faced, companies are investing heavily on organizations to recruit the talents and expertise. Training can help to overcome these challenges .so, organizations should give alot of training programmes for virtual teams that have included understandinghow to develop performance and understanding the different culture between team , building activities to enhance members' knowledge, team's goals , work processes, rules of interaction and conflict resolution.

to develop the performance of VTs , organization should set a set of strategies by which to enhance confidence and improve team results, these strategies are rotation of team leadership, clarity of the goals, division of role, High degree of initiative and integrity , coordination mechanisms that encourage and facilitate communication processes

Cultural diversity between individuals within virtual teams may be a double-edged sword, it may lead to increased creativity and innovation and the production of many ideas, suggestions and unconventional solutions to problems and software development, but cultural differences may generate conflict and mistrust between individuals and lack of full assimilation and understanding when exchanging And interpretation of information , to avoid this issue well-defined goals and vision and collaborative relations are important for developing virtual team effectiveness

That the virtual team members have a high level of innovation, to develop this behavior, we can use mutual information technology tools such as (Document Sharing and Sharing) and coordination through mutual trust and high work requirements.

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