

# Occupational Stress and Demographic Characteristics among Information Technology Professionals

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## Abstract

Occupational stress among information system professionals is gaining more recognition because it may lead to high turnover and less productivity. The present research focuses on software development professionals to examine their occupational stress and demographic characteristics in India. A questionnaire was developed to identify the occupational stress among software development professionals (SDP) using dimensions such as age, average daily working hours, gender, training and nature of work. Data from 156 respondents working in information technology companies in Chennai and Bangalore was collected. It was found that those who were more than 30 years of age have stress due to work family interface. Employees working less than 10 hours daily experience more stress due to fear of obsolescence, individual team interaction, work culture, lack of family support and technical risk propensity. In terms of gender, men and women professionals do not differ in their occupational stress. However, employees who had computer training especially in software programming in addition to their engineering degree face more stress due to fear of obsolescence and technical risk propensity. Software development professionals whose nature of work is purely technical experience more stress because of fear of obsolescence than others. The results are discussed and based on these the relevant implications are suggested.

**Keywords:** occupational stress, demographic characteristics, information technology professionals, fear of obsolescence, technical risk propensity

## 1. Introduction

Stress has become an attractive explanation of variety of phenomena. Stress is considered as interaction between forces or events outside the organism which threaten its existence or well being and its responses to them (Ivancevich et al., 1983). Stress becomes apparent from the mismatch between individual ability and his or her environment (French et al., 1982). This mismatch can occur at different levels such that stress can result if there is a difference between the institutional demands and employees ability. The ability of organisational employees differ from demographic point of view (McDermott, 1995). It is possible for mismatch between objective work environment and an employees' subjective perceptions of work environment that may lead into stress (Spector, 1997).

Stress is being referred as a precursor of illness (Ivancevich et al., 1983) as well as an important causal agent in health complications such as coronary heart disease, stomach disorders, dermatological problem, insomnia and higher levels of destructive stress hormones post-traumatic stress disorder, suicide and other physical illness (Ramachanruni et al., 2004; Karen et al., 2006; Kivimak et al., 2006; Ivancevich et al., 1983; Violanti, 2008; Shirom, 2003; Wang, 2007). Higher levels of stress can lead to absenteeism, job dissatisfaction, burnout (Brown et al., 1996; Burke & Deszca, 1986; Crank et al., 1995; Lord, 1996; Stotland & Pendleton, 1989) alcoholism and drug abuse and divorce (Anshel, 2000; Biggam et al., 1977; Dietrich, 1989; Walker, 1997; Blackmore, 1978; Chen et al., 2006).

Ivancevich et al. (1983) point out though there is expanding research on occupational stress, there is less research on systems personnel. The present study is an attempt in this regard to find out the connection between stress levels and demographic factors among software development professionals. The personnel who work in the

software industry for organisations that specialise in software development and whose core function is to design, develop and deliver software are known as Software Development Professionals (SDP). This group consists of systems analysts, designers, programmers, testers, system specialists, domain consultants and others who are directly involved in the software development activities. Software development process begins with the Business Manager / Project Manager obtaining the contract for software development from a client organisation. Software development consists of a number of stages such as conceptualisation of the problem, requirement analysis, high level design, low level design, coding, testing and support. This corresponds to the waterfall model of software development (Pfleeger 1998). Technical knowledge, adroit communication and understanding of the client work domain are important skills expected of software development professionals. Liberalisation and globalisation in India in the 1990s led the way for growth of Information Technology(IT) industry (Asmita & Bhola ,2012). Significant components of Information technology (IT) are software and hardware. Software has materialised a major industry in the field of electronics. The information technology (IT) and information enabled services (ITES) industry employs about 10 million employees in India. Hence, research on occupational stress among software development professionals becomes crucial in understanding the role of demographic factors.

## 2. Literature Review

The research on stress especially related to comparison between gender has been mixed. In some studies, it has been observed that men experience more stress than women (Palmer et al., 2005; Thory, 2013; Mohan & Ashok, 2011; Tarafdar et al., 2011; Tandon et al., 2014). According to Swanson et al. (1998) male medical doctors experience more occupational stress and less job satisfaction than female medical doctors (Swanson et al., 1998). On the other hand, other researchers found women employees experience more stress than men employee (Aditya and Sen, 1993; Sethi et al., 2004; Bogg et al., 1994; Jick & Mitz, 1985; Antonia et al., 2006; Michael et al., 2009). The study by Martocchio and O'Leary (1989) found no difference in stress among women and men employees.

Aziz (2004) reported that married employees experience more stress than unmarried among information technology (IT) employees, where as Zaki and Ali (2009) found unmarried women having more stress than married employees. Sharma et.al (2012) reported more stress among high income group than low income .

Stress seems to be higher with increasing age among bank employees (Vimala & Madhavi, 2009). Jeyaraj (2013) found a significant relationship between age and level of stress among high school teachers. A study on occupational stress and job performance among the employees of SMEs indicated a positive relationship between age and occupational stress (Affum-Osei et al., 2014). Similar results were obtained for the bank employees (Affum-Osei, 2016). On the contrary, Antonia (2006) and Tandon et al., (2014) reported that younger persons had more stress than others. Rauschenbach et al. (2013) found that there is no relationship between age and occupational stress. Balakrishnan and Swetha (2009) reported no difference in occupational stress of police officers between age groups, however the study also found that more the service lesser the stress. In a study by Mutawa et al., (2014) on the factors influencing the strain among university lecturer showed no significant difference on the level of strain with respect to age.

Ranjit and Mahespriya (2012) reported more stress with increasing age of software employees. Sethi et al. (2004) found that increases in the demographic variables resulted in higher stress for information system professionals. Few researchers have found no differences in stress between groups based on demographic variables (Stracciarini & Troccoli, 2004). There seems few research findings on stress among information system personnel though there is growing surge of occupational stress research (Ivancevich et al., 2004). The present study is an exploratory one to fill the research gap in this area.

## 3. Methodology

The sample consisted of 156 respondents. A total of 700 questionnaires were distributed to software development professionals. They were working in 22 software companies located in metropolitan cities viz Chennai and Bangalore in India. The criteria used for selection of respondents is that software professionals should have at least one year of software development experience, they should perform tasks which are technical in nature ( like programming, designing) and they should not be above the rank of project managers. This by and large excludes people with more than 10 years of experience, because they may be typically in managerial positions. This was done to make sure only software development professionals participated in the study. The low rate of response is due to heavy workload and severe shortage of staff. There were only 126 male and 30 female respondents. Their age ranged from 22 years to 34 years.

There are few attempts to measure stress among software professionals (Ivancevich et al., 1983; Weiss, 1983; Li & Shani, 1991; Lim & Teo, 1996; 1999; Moore, 2000). It has been found these studies on stress were in the

context of information systems professionals. Based on the discussion and interaction with software development professionals, Rajeswari and Anantharaman (2003) developed items representing sources of pressure arising from various types of activities such as dealing with clients, tackling issues of obsolescence, shortage of skills, project management issues, resource constraints, team management, organisational policies, dealing with diverse work culture, work family interface, etc. The respondents were required to mark the extent of pressure on a seven point scale ranging from very low intensity (1) to very high intensity (7). They were also given an option to mention if a particular item did not apply to them.

#### 4. Results

ANOVA is used to analyse if there are differences in the perception of stress based on demographic factors. The demographic variables chosen are age differences, average daily work of the SDP's, gender, training and nature of job.

##### 4.1 Age Group

The age factor for exploring differences in stress has been chosen as below 30 years and above 30 years because, there are normally perceptible differences in approach to life as increased responsibilities are felt at home (due to change in marital status), and office (due to promotion) around this stage. Table 1 indicates that SDP who are older than 30 years perceive significantly more pressure due to work family interface. It naturally fits into the current scenario in India, where, by 30 years, one is expected to be married and carry on responsibilities. They have to juggle between functions at home and office, and also face stress due to adjustments pertaining to other stress causing life events, such as marriage, childbirth etc. and also take care parents who are growing older. Studies have indicated that technical obsolescence is higher with age (Shapero, 1985). Even though the mean for fear of obsolescence, client interaction, work family interface, technical constraints, lack of family support and technical risk propensity is higher for those below the age group of thirty, the difference is not significant.

Table 1. Differences in the perception of stress based on age group

No.	Factors	Mean (Age group)		F	p-value
		Less than 30	More than 30		
1.	Fear of Obsolescence	2.952	3.189	0.86	0.35
2.	Individual Team Interaction	2.989	2.852	0.22	0.63
3.	Client Interaction	3.317	3.482	0.30	0.58
4.	Work Family Interface	2.647	3.208	4.25	0.04*
5.	Role Overload	3.052	3.218	0.36	0.54
6.	Work Culture	1.81	1.895	0.09	0.75
7.	Technical Constraints	3.365	3.508	0.40	0.52
8.	Lack of Family Support Towards Career	1.892	2.375	3.19	0.07
9.	Workload	3.458	2.958	2.66	0.10
10.	Technical Risk Propensity	2.585	2.861	1.00	0.31

\*p <0.05 level of significance.

##### 4.2 Average Daily Working Hours

The differences on perceptions of stress based on average daily working hours are compared between those working more than 10 hours and those working less than 10 hours. The result is presented in Table 2. A normal working day consists of eight working hours, but it is often impossible for SDPs to adhere to such timings so they typically work longer. The software industry relies on software exports to clients particularly in America and Europe and hence, software development professionals spend long hours extending to late nights to beat the project deadlines or interacting with clients or trouble shooting or updating.

Software development professionals who work less than ten hours per day on an average feel significantly higher stress due to fear of obsolescence, technical risk propensity, individual team interaction, work culture and lack of family support towards career than software development professionals who work more than ten hours per day. It is normally expected that people who work more hours per day will be more stressed than people who work less per day. On the contrary, software development professionals who spend less hours at work per day, seems to feel inadequate because they do not spend enough time at work learning new skills. They may feel insecure because, they think they miss out on information that others who are present obtain. People who work longer

spend more time on the job, which makes them more experienced as compared to those who spend less time at work as the number of hours they spend interacting with computers is high. So they may perceive less fear of obsolescence and do not get stressed about taking technical risks.

Those software development professionals who tend to spend a lot of time in office get to know their colleagues better, as they are more inclined to have more interaction sometimes even out of the scope of their work. This enables them to have more cohesion. Their level of acceptance of each other's attributes is also higher as they develop a sense of *bonhomie*. This may lessen the pressure that may arise due to individual team interaction. Pressure due to work culture is less for people who spend more number of hours at work, because they get to be present in more tele-conferences which provides opportunities to interact with clients, develop a rapport and also understand their culture. Stress due to technical risk propensity is higher among software development professionals who work less than ten hours per day. They probably feel inadequate about their skills set due to less time spent on training. In addition they also have stress due to fear of obsolescence and individual team interaction. In combination, all these factors create a sense of inadequacy leading to perception of stress in the face of attempting new technical activities that involve considerable risk.

Table 2. Differences in the perception of stress based on average daily working hours

No.	Factors	Mean		F	p-value
		(Average Daily working hours) Less than 10	More than 10		
1.	Fear of Obsolescence	3.2613	2.4879	17.86	0.00***
2.	Individual Team Interaction	3.1538	2.6280	6.1	0.01**
3.	Client Interaction	3.4597	3.1273	2.18	0.14
4.	Work Family Interface	2.7383	2.7247	0.00	0.94
5.	Role Overload	3.1498	2.9455	0.97	0.32
6.	Work Culture	2.000	1.500	6.14	0.01**
7.	Technical Constraints	3.4832	3.2109	2.58	0.11
8.	Lack of Family Support Towards Career	2.1881	1.5591	9.90	0.00**
9.	Workload	3.3366	3.4636	0.29	0.58
10.	Technical Risk Propensity	2.8119	2.2909	6.55	0.01**

\*\*\*p <0.001 level of significance

\*\*p <0.01 level of significance

\*p <0.05 level of significance

#### 4.3 Gender

Due to the mixed results related to stress in terms of gender in previous literature, it was considered important to see where differences exist in stress in the current study. In addition, the position as a SDP generally attracts both genders and in India, the same situation is seen. Information technology is perceived as a new industry and hence, is devoid of a long legacy of gender segregation. Because it is experiencing rapid growth and is under going constant change, the profession is seen as a relatively open one (Greenbaurn, 1979). Interviews with respondents and observation of software development environment during the process of data collection have brought out no issues that are relevant to a particular gender. Yet it is worthwhile to understand, if there are variations in their perception of occupational stress. In the current study, it is found that there is no significant difference in the way men and women perceive stress among software development professionals in India as presented in Table 3. In a meta-analytic review of studies on gender differences, Martocchio and O'Leary (1989) also found no significant differences in the perception of occupational stress between men and women. But some studies (Nelson, 1990; Davidson and Cooper, 1983) found that women perceive more stress as compared to men in their professions. In a study on Information System professionals, Lim and Teo (1999) observed significantly higher stress in women as compared to men with respect to work demands, relationships with others, systems maintenance, role ambiguity and administrative tasks. In a more recent study on Information Systems Professionals. Gallivant (2003) found that stress levels of women were higher as women perceived themselves to be overworked.

Table 3. Differences in the perception of stress based on gender

No.	Factors	Mean		F	p-value
		Male	Female		
1.	Fear of Obsolescence	2.9925	2.9722	0.00	0.93
2.	Individual Team Interaction	2.9646	2.9846	0.00	0.93
3.	Client Interaction	3.3639	3.2524	0.16	0.68
4.	Work Family Interface	2.7279	2.7571	0.01	0.90
5.	Role Overload	3.0804	3.0667	0.00	0.95
6.	Work Culture	1.8413	1.75	0.13	0.71
7.	Technical Constraints	3.3238	3.6533	2.57	0.11
8.	Lack of Family Support Towards Career	1.9206	2.1583	0.91	0.34
9.	Workload	3.3135	3.6667	1.57	0.21
10.	Technical Risk Propensity	2.7037	2.3111	2.46	0.11

#### 4.4 Acquisition of Software Training form Private Institutions

Software development professionals rely on their educational background to enter software industry. It is not uncommon to see young professionals who have joined the software companies as trainees and are presently serving as project managers or project leaders. Interviews with software development professionals have revealed that they attend certified software training courses offered by private training institutes in order to keep themselves up to date or change domains. It also helps them in career advancement. Data is analysed to investigate if there are differences in the perception of stress based on whether software development professionals have acquired software training from private institutions (e.g. APTECH, NHT etc.) or not. The result is presented in Table 4 found software development professionals who have undergone private computer training perceive significantly higher stress due to fear of obsolescence and technical risk propensity. Majority of software development professionals in this study who are non-computer science graduates have typically undergone private training. The trend probably indicates that SDPs who have an educational background in other engineering disciplines may not be confident of their software training and hence undergo software training in private training institutions to keep themselves up to date. They may perceive more stress due to fear of obsolescence, either because they feel inadequate due to their educational background or they are more aware of the state of art (due to their training) than their counterparts and hence are worried about keeping pace with the emerging technologies. Technical risk propensity is related to risks involved in using technology, or technology forecasting etc. for which one should have updated technical knowledge. If there is fear of obsolescence, it can also contribute to stress due to technical risk propensity.

Table 4. Differences in the Perception of Stress Based on acquisition of software training from private institutions

No.	Factors	Mean		F	p-value
		Acquired computer training Yes	No		
1.	Fear of Obsolescence	3.2510	2.6903	9.76	0.002**
2.	Individual Team Interaction	2.9926	2.9410	0.06	0.80
3.	Client Interaction	3.2289	3.4716	1.26	0.26
4.	Work Family Interface	2.7625	2.7006	0.09	0.75
5.	Role Overload	3.1340	3.0137	0.36	0.54
6.	Work Culture	1.7651	1.8904	0.40	0.52
7.	Technical Constraints	3.2843	3.5041	1.83	0.17
8.	Lack of Family Support Towards Career	2.0030	1.9247	0.15	0.69
9.	Workload	3.4518	3.3014	0.45	0.50
10.	Technical Risk Propensity	2.8795	2.3425	7.64	0.006**

\*\*p <0.01 level of significance

\*p <0.05 level of significance

#### 4.5 Nature of Work

The respondents have been chosen to include software development professionals who work in purely technical jobs such as programming and software design as well as ones who work in jobs that demand both technical and managerial skills. Analysis is conducted to explore if there are differences in the perception of stress based on nature of work performed by software development professionals. Results in Table 5 indicates that there is a significant difference between software development professionals whose nature of job is purely technical in nature and software development professionals whose nature of job is both technical and managerial in nature. The difference in the perception of stress is due to fear of obsolescence. In all other dimensions there is no significant difference. The perception of stress due to a workload and client interaction, role overload, work culture and technical constraints is high among software development professionals who perform managerial tasks in addition to technical tasks. This is indicated in the corresponding mean values. Yet the difference is not significant enough to be highlighted. The career growth of software development professionals who work in purely technical talks like programming and designing are largely dependent on their technical knowledge and skills. In a study by Bailey and Stefaniak (2001), the important skills indicated as important by programmers are more in the nature of general technical skills such as problem solving, and readiness to adapt to rapidly changing environment. Among the technical skills, ability to read, understand and modify programs written by others, ability to code programs, ability to debug software were rated as the top most skills followed by knowledge of structured programming fundamentals, ability to implement programs and knowledge of multiple programming languages. This rating gives an indication on the nature of technical knowledge that programmers must possess. This involves a lot of learning and constant updating, for which they have very little time and effort to devote, as their work in current projects take all their time. Hence, they may perceive more stress due to fear of obsolescence than others. For software development professionals whose nature of job is also managerial in nature, a lot of time and effort is spent in managing the software development project, and as they aim for higher promotions their jobs are likely to get more managerial in character and hence they may not consider technical skills as important as soft skills or management skills.

Table 5. Differences in the perception of stress based on the nature of work

No.	Factors	Mean		F	p-value
		Technical	Tech & Magrial		
1.	Fear of Obsolescence	3.1734	2.7299	5.817	0.01*
2.	Individual Team Interaction	3.0769	2.8166	1.54	0.21
3.	Client Interaction	3.2998	3.4022	0.21	0.64
4.	Work Family Interface	2.7849	2.6615	0.37	0.54
5.	Role Overload	2.9533	3.2519	2.2	0.13
6.	Work Culture	1.783	1.8808	0.24	0.62
7.	Technical Constraints	3.3473	3.4431	0.33	0.56
8.	Lack of Family Support Towards Career	2.1044	1.7731	2.79	0.09
9.	Workload	3.4890	3.2308	1.31	0.25
10.	Technical Risk Propensity	2.7070	2.5179	0.88	0.34

\*p <0.05 level of significance.

Tech &Magrial-Technical and Managerial.

#### 5. Discussion

The goal of the current study is to explore the factors that cause negative pressure to the software professionals, from the purview of software development process. Fear of obsolescence is a critical factor that causes stress among software development professionals. It is a serious issue because- the cost of obsolescence is high for the individual as well as the organization. If a software development professional feels he/she is at the end of the road and cannot tackle the growing challenges in technology, negative attitude towards the job sets in and hence he/she becomes isolated in the profession and stops communicating (Shapero,1985). Such individuals have a negative impact on the expectations of newcomers in the organization, tends to cynical about new efforts in the organization. Since the person attitudes and behaviour changes in a negative way in response to stress due to fear of obsolescence, the person is said to be approaching the stage of burnout (Chernis,1993). Also, these negative

thoughts have dangerous implications for the growth of the organizations. The degree to which software development professionals lack appropriate competence hurts their employability as well as their organizations' adaptability and promise of future competitiveness (Stewart, 1997). Therefore the management of the software development organizations should take efforts to address the issue of technical and professional obsolescence of its employees.

Individual team interaction is another cause of stress in software development process. This is because, in software development, one functions as a part of the larger project team all the time and yet everyone is responsible for the performance of the smaller team (members who work on a module) to which they immediately belong to. The success and failure of individuals have snowballing effect on the entire team, and also the outcome of the entire process rests collectively with the whole team. Though under certain conditions, one would appreciate the variety that characterizes the software development team, at different conditions, it may be a deterrent to team effectiveness as one has to deal with varying levels of expertise, skills, knowledge, exposure, background and belief in the effort of the team as a whole. Diversity in the capability of team members puts pressure on the highly competent software professionals as she/he has to distribute his/her time efforts on training fellow team members in order to make up for the work of the less competent professionals in the team so that the quality of product is good and the time schedules are kept. It implies that team members (especially more competent members) have to take on multiple roles which causes role overload. In addition, tight time schedules and shortage of skilled personnel increase the workload of the team members.

It follows from the above that software professionals are bound to spend a lot of time away from home and hence, feel a loss of control in the home life. This leads to disturbance in work family balance. Handling responsibilities at home and at work puts a lot of stress on the software professionals. And they start working mechanically rather than creatively. It is hard to isolate workplace stress and personal stress. It is even harder to pinpoint the costs that businesses and organizations incur due to personal stress and work place stress. This has prompted software companies to give more control over the job to software professionals, by introducing flexi-time at the workplace. The lack of family support towards career of software professionals indicate that families show a lot of understanding and also provide motivation for the career growth of software professionals. It is because, in India the values of family are very strong and it provides the support to deal with great amount of stress in India. During interactions with software development professionals in the course of data collection, it was found that software companies acknowledge the support their employees get from their families by encouraging family participation in corporate functions that are held to recognize employee contributions.

Client interactions form an important aspect of software project management. Cordial client interactions, right from the stage of 'defining requirements' to 'software delivery', determine the success of a software development project. Interviews with software development professionals revealed that clients are often not clear of their current requirements and are also unable to predict future requirements that the software that is being developed has to fulfill in the future. So a lot of effort is necessary to find the problem of the client for which software is needed and therefore, provide not only software, but also a system that gives total information solution. This is done in order to provide not just 'customer satisfaction' but 'customer delight' so as to enhance client relationship. It is this process that the software development professionals found it very stressful because it involves interacting with clients through teleconferencing (mostly at nights when they are tired after work). Understanding the accent of clients (because most of the clients are based in USA or Europe), getting to know their method of functioning, their culture and the way they convey information (sometimes even they were unaware of the requirements).

Software development professionals feel a lot of stress particularly in the stage of 'requirements definition' because successful design and development of the software largely rests on successful completion of 'requirements definitions stage' (Pfleeger, 1998). Success of client interactions largely depend on understanding the organizations of the clients, work culture of the clients which is normally inline with the national culture of the country in which the organization is located. Typically the countries of the clients are USA, Europe or West Asia. The software professionals have to be adaptive to national cultures as well as work cultures of various countries. The software development professionals belong to the well-educated, net savvy group of people who get to know about the culture of various countries of their operation through the net. In addition, the software companies conduct culture sensitivity training to the software development professionals that also equip them with necessary knowledge to deal with clients from various countries. Hence, dealing with work culture of various countries is not a major source of stress among the current group of respondents.

Making a success of the software profession involves not only translating technical skills and knowledge to successful projects, but also soft skills necessary for adroit people management. The implementation of People

Capability Model (Curtis et al., 1995) in software companies is a good example in this trend.

## 6. Implications and Conclusion

The study brings out certain factors that cause stress among software development professionals. The difference between the applicability of the findings of the current and that of earlier studies is that this study is more focused on the software development professionals in India and their specific work environment and hence, is more reflective of actual task profile and work behaviour of software development professionals. Due to this, interventions can be tailor-made to cater to specific groups.

Analysis of the stressors at work reveals that most of them are either related to perceived inadequacy with respect to technical competence or with respect to soft skills. Management can equip the software development professionals with adequate technical skills as well as competencies in soft skills such as communication skills, coordination and conflict management. In particular fear of obsolescence is related to turnover (Watson, 1999) and hence management should take responsibility to equip software development professionals with knowledge and skills related to the present as well as future.

The hiring process of software companies can focus on recruitment of software development professionals with technical competencies, along with the right attitude and motivation towards professional development and commitment towards organization. This can be achieved by integrating methods to evaluate the candidate's personality characters, efficacy behaviour, motivation to perform and ability to excel in the face of continuous challenges in the hiring process. This facilitates creation of an ambient environment that enables software development professionals to perceive less stress due to the factors mentioned in the current study and also cope with the stressors.

In addition, software development professionals typically feel enthusiastic to learn and perform if they work on challenging assignments and hence, the software companies should take efforts to obtain software projects that involve working with state of art technology.

The management can design specific interventions to cater to specific groups of people. Some suggestions are as follows:

Software development professionals who are above thirty years of age can be given inputs on handling work family interface. Management can encourage family participation on days when the software project teams/software companies celebrate their success, so that families feel involved with the work of their children/spouses and encourage them to perform better. Software development professionals can be permitted to work for flexible hours, which might enable them to perform home-related tasks as when required. This may also garner support from family members in the career pursuit of the software development professionals. Managers can take efforts to create an open work environment, by encouraging more sharing of information, ideas and opinions. Peer group training can be used as an aspect of performance appraisal to encourage knowledge sharing and cross-functional training. Management must encourage software development professionals to undergo technical training particularly in the challenging domains so that they develop a sense of confidence in themselves.

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