

Perceived Factors in Professional Obsolescence: A Qualitative Exploration of a Government Research and Development (R & D) Organization

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Many of the current problems in research and development (R & D) organizations concern the management of human resources. Moreover, professional obsolescence has become a serious problem at research oriented institutes. While many researchers have been conducted on private organizations especially on managers and few on scientists, no research has been conducted on the issue of obsolescence in government research organizations. The present study attempted to explore the factors associated with obsolescence in a government R & D organization. Researchers conducted 45 interview and gathered qualitative data in the form of open ended questions. The data was treated with thematic analysis and has been presented using a thematic network analysis. The findings confirm to the job characteristic model by addressing role related issues and bring out certain inferences about how various government functional procedures may hinder performance. The data also highlights the importance of using different communication channels for dealing with professional obsolescence.

Keywords: Communication, Obsolescence, Research and Development.

In recent years, the issue of professional obsolescence has become one of the increasing concerns to managers and behavioral scientists. Presently, rapid changes and developments in technology and the growing abundance of knowledge have resulted in a progressive decline in the useful lifetime of formal professional training. Several recent conditions have catapulted into prominence the issues of professional obsolescence and updating. New changes in this area have increased the requirements for greater expertise in all professionals. New facts, theories, and concepts have been coming up as the change of the time. Due to technological changes and innovations the requirements of the skill in most of the professions have been changed. Latest knowledge is playing a very crucial role especially in interdisciplinary areas. A person's stock of knowledge has usefulness for a finite period of time; however, it becomes outdated and must constantly be replaced by new knowledge. On the other hand, it is pertinent that professionals be accountable for their actions. Due to increased professional's

incompetence and obsolescence among the most of the employees, the effectiveness and efficiency of the research organizations are decreasing day by day.

Individual competence comprises of two important factors, the ability of the individual as well as his willingness to fulfill work environmental requirements. Obsolescence however, sets in when an employee no longer possesses the knowledge or the ability required to perform a task well. This could result from the employee's failure to acquaint himself and adapt to new technology, new procedures and other changes that are being incorporated within the organization. According to Kaufman (1978), "Obsolescence is the degree to which professionals lack the up-to-date knowledge and skills necessary to maintain effective performance in either current or future work. Thus it is possible to differentiate job obsolescence – pertaining to one's current job assignment from professional obsolescence – the capability to perform in new and different jobs in one's profession" (p.22). Jones and Cooper (1980) have defined obsolescence as

the failure of a manager's knowledge and skills to remain aligned with the present and forthcoming requirements of job. Research studies have cited two types of obsolescence that can hamper the growth of an employee. Ability Obsolescence, which occurs when the abilities and skills of the employee are no longer sufficient to meet the needs of the job. Second type of obsolescence is the Attitudinal Obsolescence, where the employees fail to maintain flexibility in attitude to update their skills (Mahler, 1965). Therefore, Obsolescence is said to occur when there is a gap between the job needs and employee's capabilities. It however, is not just limited to derisory possession of knowledge of the field but also relates to the problem solving abilities of the employees (Klemp, 1979).

Overtime, various researchers have dabbled with the concept of obsolescence; some like Burmck and Pati (1970) see obsolescence as the innovation driven discrepancy between job needs and professional capabilities when a manager's knowledge and skills fall short of accomplishing the job. Shumaker (1963) defined obsolescence as a reduction in technical effectiveness resulting from a lack of knowledge of the new techniques and new technologies that came into play since the acquisition of the individual's education. Kaufman (1974) contends that professional obsolescence occurs if the job is not challenging or stimulating. Professional obsolescence implies a lack of competence on a higher level, that of originality and innovation. It can be defined as the extent to which an employee lacks the current knowledge or new skills necessary for efficient performance of the work roles (Rong & Grover, 2005). Implicit in this definition is the assumption that professional updating can play a major role in combating the process of obsolescence. An individual's failure to perform adequate updating behavior can be viewed as the primary cause of his/her professional obsolescence.

Causes of professional obsolescence are many, and a number of other interacting factors have been found to be involved. Several authors suggest that certain attitudes, behaviours and motivational patterns are symptomatic of obsolescence. Some of the signals for identifying the setting in of obsolescence within the

individual were pointed out in a study by Burack and Pati (1970). They identified a number of conditions leading to managerial obsolescence: being out of touch with the newer developments, an unwillingness to learn, lack of motivation towards self education, family obligations and pressures, desire to stay within one's comfort zone and failure to perceive potential future change to name a few. Interestingly, it is not always the professional's rigidity or lack of motivation that leads to obsolescence, at times it is the organization that they are a part of which can lead to obsolescence. These organizations tend to impose structural limitations on the employees with rigid controls in place, which prevents the employees from widening their horizons and scope of knowledge. An individual may be required to overspecialize in a certain areas to the point where he operates on a low level of use of his professional knowledge. Or it may be the specialization that the individual selects for himself that is so narrow that he becomes unaware of new developments in his field. Further, the mutual expectancies between the individual and the organization can create or combat obsolescence. This is what Levinson (1971) calls the psychological contract... "What the person expects from the organization, his experiences in dealing with the organization, and how much he trusts the organization for need fulfillment influences his updating." Another factor which is known to contribute in professional obsolescence is that of "half-life of competence." This happens when after completion of professional training and due to new developments; the competence of practicing professionals to meet the demands of their profession gets reduced to half of what it used to be at the time of their graduation (Dubin, 1972).

No work sector is free from this form of professional obsolescence, be it the research and development sector, the government sector or the corporate enterprises. The key to overcome such a state is to be aware of the signs, and tackle them early on.

Direct Effects Model of Obsolescence

Direct effects model proposed by Kaufman (1974, 1978) puts forward three important

causes of obsolescence, that of individual characteristics, nature of work, and organizational climate. Individual characteristics refer to the personal dispositions, needs, and aptitudes that act as important predictors of behaviour and outcomes. Nature of work reflects the extent to which assignments and work routines are perceived to be intellectually and psychologically challenging by the professionals. Organizational climate refers to the employee's perception of the organizational environment. This environment comprises of social relationships and influences, managerial practices and organizational rewards and reinforcements that contribute in either promoting or stifling the growth of the professionals.

A major hurdle in combating professional obsolescence is that of motivation. In order to be competent, the employee must be motivated to update his skills with the new developments in his field. Dublin and Cohen (1970), in their model illustrated that motivation to be up to date with the developments in one's field is governed by both psychological as well as environmental variables. These variables include achievement motivation, organization climate supporting creativity, the support and facilitation given by the supervisor, stimulating work assignments that promote problem-solving skills, and nurturing social interactions and relationships.

Obsolescence in R & D organizations

Many of the current problems in R & D organizations concern the management of human resources. Environmental changes contributing to this problem may include increasing average age, new age discrimination laws, technological obsolescence, lack of continuing education, various engineering unions and increasing disenchantment. Many R & D managers consider that the inability of older engineers to adapt to rapidly changing technology and unwillingness or resistance to change is the major causes of R & D problems. Lack of understanding of the concept of obsolescence by both individuals and managers and lack of professional growth coupled with difficulty motivating seem to be the major causes of increasing organization level obsolescence.

There are various factors that contribute to obsolescence in a research and development organization. An exclusive focus on product planning instead of the growth and development of skills of the personnel may lead to a gap between the knowledge and demands of the job. Cost systems working against career development, inadequate manpower planning, and resistance on the part of the supervisors to share available information and resources can also lead to professional obsolescence. A study of training needs by Barrett, Bass and Miller (1972) in the R & D sector found that handling work five years in the future would require skills different from those considered to be sufficient currently and that a large number of professionals would require continuous training or substantial retraining to survive in the rapidly changing world of work. Kabakci and Odabasi (2008) conducted a comprehensive survey study with 1095 research assistants who worked in 54 education faculties of 44 state universities in Turkey. Findings revealed that research assistants in Turkish education faculties were highly in need of faculty development in view of professional development, institutional development, instructional development and personal development, respectively.

A study by Guttel and Konlechner (2007), investigated the dynamic capabilities in ambidextrous organizations, to balance their contradicting learning directions and to avoid competence obsolescence. The study revealed that ambidextrous organizations are permanently endangered of becoming obsolete since they are governed by high order dynamic capabilities, that can be perceived as balancing routines and, thereby, fulfill functions of conflict regulation, reflection and integration.

Obsolescence in Government Sector

Different forms of obsolescence come into play when we look at the phenomenon in a government setup. It could be role related, motivational obsolescence, obsolescence dependent on the procedures prevalent in the organization and obsolescence due to the kind of communication that takes place within the organization. Training has been looked on as an area that if ignored can lead to 'role

stagnation'. Often government organizations do not see training as their primary concern. However, if training needs of the personnel are given importance to, it can reduce dependency on each other thereby reducing obsolescence. Noe (1986) found that individuals are likely to put in more efforts in training if they recognize that it will result in a better performance in training, leading to achievement of desired outcomes and avoidance of undesired outcomes. Process of appraisal that is followed in an organization also might contribute to obsolescence. Individuals might report that their efforts and progress is unacknowledged when the assessor does not possess a nuanced understanding of their work.

Although internal motivation plays an important role in determining the effort that the employees make, external motives like rewards and incentives also play a key role in maintaining the motivation and initiative taken by the employees (Cerasoli, Nicklin & Ford, 2014). Motivation to update among managers has been studied by Landis (1969) and Glaser (1963). They found that when managers do not perceive actual rewards or advantages in keeping up to date, they will not be encouraged to further learning. Research carried out by Rishipal and Chand (2012) found a positive relationship between counterproductive work behaviour and locus of control among government employees. They suggested that rapid development in the field of technology leads to skill obsolescence which in turn contributes to employee obsolescence and affect employee behaviour at the workplace. Perceived job autonomy on the other hand can help in enhancing the performance of the workforce since the employee tends to believe that he/she is trusted to perform a task well. Such a positive perception about one's skills leads to an increase in motivation (Langfred & Moya, 2004). Benton, Gelber, Kelley and Liebling (1969) found that quality of information tends to be associated with the level of trust that the individuals share, which does have an impact on his/her performance. An inherent issue that affects all the employees at some point or the other in their careers in a government setup is the belief of 'lazy worker'. Since a government organization offers job security to the individuals, it is believed that the workers do not feel

motivated to update their skills with the change in technology, which results in professional obsolescence. Accountability of behaviour and group dynamics also seems to contribute in setting in of obsolescence.

Loo (2007) carried out a study on Dutch government employees measuring the speed of skill obsolescence and found that the yearly rate of skills obsolescence was 2.6%. This rate was impacted by educational attainment level, occupation, and sector of employment. However, by working on improvement of training and employability policies, this rate could be decreased, as skill obsolescence could be prevented by continuous investment in human capital. Study by Blanton, Schambach and Trimmer, 1998; used Kaufman's direct effect model to measure obsolescence and found that organizational climate and the nature of work directly influenced the adequacy of professionals. Jones and Cooper (1980) also concluded that the importance of keeping up to date was perhaps the single most important variable distressing obsolescence. The role a supervisor/manager played also impacted the extent to which an employee felt out of touch with the skills required to complete the job. In cases, where the supervisor was reported to be supportive the employees reported a lower rate of obsolescence, where as when no support was perceived, employees reported being disenchanted towards their work and organization. Researches in the past have depicted a significant relationship between the amount of emphasis placed by the management on staying current and obsolescence. Therefore, management objectives and policies seem to play an important role in the degree to which obsolescence might set in.

There might be many other perceived factors which might be causatively associated with professional obsolescence by the scientists working in government organization. However, there is a significant dearth of empirical evidence in this direction in India as well as across the globe. The present study is an exploratory attempt in this direction to understand what the scientists themselves feel about the

concept of obsolescence in government R & D organizations and what the perceived factors that cause and/or promote obsolescence are.

Method

In order to have a larger scope of coverage of perceived obsolescence causing factors in government R & D organization, the present study was conducted on the scientists working in an Indian government research and development organization using the qualitative approach.

Participants

The sample of study included a total of 45 participants, of which 24 were males and 21 were females. The participants were in the age range of 25-40 years and were serving at junior to middle levels with service experience ranging from 4 to 15 years. The participants were drawn from different Delhi (India) based laboratories of an esteemed government R & D organization. Incidental sampling method using rank database availability was employed. Though the participants were currently based in Delhi, they originally hailed from different parts of country with significant cultural and social diversity.

Procedure and Analysis

Informed consent was taken from the participants of the study. Data was collected using a semi-structured interview schedule by a trained research-assistant. The duration of the interviews ranged from 20 minutes to 60 minutes. Most of the participants were found to be forthcoming in discussing issues of obsolescence, while a few were hesitant about disclosing their stance on the issue. Consent for recording the interview was taken from the participants. Out of 45, 20 participants gave consent for recording of interviews while, 25 participants did not give consent to recording of interviews while consent was given for noting down interviews. The recorded interviews were fully transcribed while the unrecorded interviews were well noted down.

The transcribed data was analyzed following the 5 phases of thematic analysis given by Braun and Clarke (2006). In phase 1, familiarization of the data was done by repetitive reading through the entire data set. Then, initial coding was

conducted in phase 2 to organize segments of data into meaningful codes. After coding all the transcripts, the codes were then sorted into potential themes in phase 3 by recognizing meaningful repeated patterns across the data. Inductive coding technique was used to find novel constructs. In phase 4, these themes were independently reviewed. The independent review and revision of themes involved reexamining the original data for relevant incidents of data for each potential theme; expanding, collapsing, or discarding of initial themes; generation of new themes; and re-discussion of themes. The concepts of thematic networks were applied in phase 4 to facilitate the structuring of themes, in which the basic themes derived from textual data were grouped into the organizing themes which were then linked to form global themes that captured the principal tenet. These were presented as a model depicting the multiple levels of themes and their relationship. Next, in phase 5, the themes and networks were defined and named. The findings were grouped and tabulated and the results were discussed.

Results and Discussion

The qualitative data obtained for the study through personal interviews was subjected to thematic analysis. Numerous basic themes related to the aspects of base level functioning in organization as perceived by the participants of study were emerged to be associated with the issue of obsolescence in the sampled organization. The similar and related basic themes were grouped together in the form of organizing themes representing the issues at broader level. Likewise at the next level the organizing themes were placed together to represent global themes or global domains of organizational structure that play crucial role in cultivating and promoting obsolescence. Table-1 presents the emerged basic, organizing and global themes underlying professional obsolescence.

The data provided the insight that the obsolescence related problematic issues in the present organization can be covered under four global domains related to procedural issues, role related issues, motivational issues, and organizational politics related issues.

Table 1: Perceived factors associated with obsolescence: list of derived themes

Basic Theme	Organizing theme	Global Theme
Procedural Scapegoat Time intensive Determines trust in the organization	Procurement	
Training Need Prevent Stagnancy Basic -Updating Niche Building	Training Conducted Transfer of Learning Redundant Selection bias	
Lack of Manpower Need for stratification High recruit turnover	Recruitment	Procedural issues
Assessment Need Proximity to Evaluator Standard Criteria	Assessment Conducted Doubt on Assessor Competitive	Assessment Appraisal
Task related issues Role alignment Role ambivalence Security Interest	Individual Role	
Aspired mentor Aspired Freedom Manager/ Decision maker Duty of updating mission	Supervisor	Role related issues
Accountability Knowledge Difference	Responsibility	
Gender issues Reward Structure Team building Work Engagement Intrinsically driven	Mode of Motivation	Motivation issues
Creativity and critique Problem solving	Aspired Autonomy	
Disclosure and Transparency Personality dependent Informal channels Dependent on Organization structure	Communication Vs Networking	Politics related issue
Team Size Coercion Hierarchy	Dependent manifestations	

As seen, the findings revealed four important antecedents to professional obsolescence namely, procedure dependent obsolescence which means that it is caused due to the processes in the organization that are tangible and on record; the second factor reflects the role related issues, which are factors that are concerned with the individual's role, his supervisor's and their understanding of responsibility; the third factor deals with the motivational issues and the last factor talks about the political issues centered on communication patterns within the organization, the structure of the organization and the issues of accountability and power.

As part of the procedurally dependent obsolescence, procurement practices have found support throughout the laboratories and personnel, reflecting what might be a normative variable that contributes to the scientists being obsolete. The researchers found many scientists disavowing the procurement process as not their duty; while others have reported stagnancy at the higher level. Procurement is also a time consuming process which often leads to deterred motivation and often failed expenditure. On the other hand, procurement process is often used as the scapegoat to draw the attention away from the real issues at hand that of poor performance and inability of the scientists to keep up with the changing needs. However, procurement also serves a connecting focal point for organization to have a joint understanding of the problem.

A related issue that emerged from procedure driven obsolescence was that of training. Training is another area where people felt limited initiative and the ambidexterity of the organization was questioned. Training is also seen as a means to build niche and also lessen dependency on others which would ideally lessen professional obsolescence. This goes in line with Noe's (1986) assertion that trainees will be more motivated to perform well in training if they perceive that high effort will lead to high performance in training, which could then lead to obtaining desired outcomes and avoiding undesirable outcomes. However, training needs are often not given enough salience as publishing and therefore, training is often not seen as a primary motive. On the other

hand some scientists appreciated the avenues available for training.

On the whole, similar to Antonacopoulou's (1999) view, an overriding factor which appears to limit learning through training is the preoccupation of individuals and the focus of organization's expectations and the focus of individual to be politically correct.

Another issue, Assessment as a whole was understood to be a competitive domain as majority of the participants vouched that there is tough competition to get promotion. However, a key area of contention was the doubt on the credibility of the evaluator whom, many participants thought either lacked a nuanced understanding of their work or did not understand their work at all. Therefore, the finding revealed that assessment was a contentious issue where the organization with the best intention had failed to connect with how the employees understand the procedure. Motivation was also found to be an important perceived factor that contributed to obsolescence. It was found that intrinsic motivation was highly valued for work engagement and motivation. While intrinsic motivation is important, external rewards are seen to be equivalent to the quantity of performance (Cerasoli, Nicklin & Ford, 2014). The structure of reward emerged as a key in the participant's perception of feeling obsolete or not, pointing towards the need for standardized reward system. Lack of aspired autonomy also emerged as a key correlate of obsolescence.

This is supported by past researches which found that job autonomy enhances performance because workers with high job autonomy will perceive that he/she trusted to perform the task (Langfred & Moe, 2004), such a positive perception increases motivation and also leads to a higher performance. Job autonomy was also seen as the most critical element in the Job Characteristic model which facilitates positive emotions. Ryan and Deci (2006) note that job autonomy is central for intrinsic motivation (Pierce, Jussila, & Cummings, 2009). The present study revealed that job autonomy was not a characteristic of many labs under study, which contributed to a feeling of being undervalued or disrespected.

Another global themes related to obsolescence is that of role related issues and in that the personnel role relations feature predominantly and aid in one's performance and keeps motivation high for updating. The data clearly aligns to the job characteristics model as stated by Oldham and Hackman (1986). Moreover, there are specific role related issues such as specificity and role clarification (Turbe & Collins, 2000). Many scientists did report that their supervisors helped them with their administrative work. The supervisor, due to their experience is then, a model scientist and a manager who is preparing other employees in their direction (Burke, Borucki & Hurley, 1992). Therefore, the leader is almost like a parent and a 'good' supervisor can impact a person's work to quite an extent (Maertz, Griefith, Campbell & Allen, 2007). Overall, the supervisor becomes key for an employee feeling obsolete or not (Kopelman, Brief & Guzzo, 1990).

Communication is shaped by the organization culture and as it is a bureaucratic organization, the communication is rather hierarchical. The present study revealed that there was an undertone of mistrust among the scientists and as a community they seemed to be apprehensive of each other's actions. It was noticed that a covert 'networking' existed within the office environment and played an important role in how one is perceived, or is obsolete. This is in line with the existing literature that quality of information is associated with higher levels of trust (Benton, Gelber, Kelley, & Liebling, 1969) and a strong relationship exists between the flow of information and trust (Becerra & Gupta, 2003)

Politically dependent manifestation was one of the key themes found during the analysis, it was primarily noticed in the way work is divided, trainings are done, procurement, assessment and decision making, therefore rendering it into the procedural dynamics of things. Furthermore, such existence location of politics may even hint at the gap between 'expedited' and 'reality'.

Considering the hierarchy, a few scientists supported the idea that hierarchy (positional power) plays an important role. It captures the essence that probably there are some principles of communication into play; the dimension of

power and coercion of power in particular is considered. The aspect of 'higher power location' in the sense of decision making being in others' hands also gives an advent for their general sense of frustration. A key feature of issues such as these is the associated 'communication channels' and the 'trust' in place for it, which makes it necessary to have good skills that can get one necessary, it becomes slightly personal rather than the espoused impersonal structure of the process. Closely related to communication is the idea of networking as an alternative to various procedural impediment, where scientists who have links with-in and outside the organization are able to get knowledge quicker and also get their work done leading to less professional obsolescence. The key characteristic of networking is the dimension that it does not follow a hierarchical pattern. Task autonomy and supervisor's role linked with both external and internal motivation which then becomes key to increase organizational effectiveness and reduce professional obsolescence.

Conclusion and Implications

Though the study was conducted on a small sample taken from only one organization, this provided valuable insights about perceived causal factors behind professional obsolescence and checking it. Given that job security plays either an enhancing or depreciating role in terms of performance obsolescence. It must be clearly explored to look into ways to amend it and make it into a strength rather than a weakness of the government organization. The role of supervisor in Indian setting is considered paramount and such trainings must be provided on leadership and socialization such that supervisors can play a facilitating role. With respect to the issue of communication, there is a need for transparent communication and employees be involved in the decision making. A failure to heed to such demands will lead to poor satisfaction and risks the problem of turnover. Observe in ways grapevine communication may prove to be useful and design psychometric tools that measure such forms of communication. Procedural issues must be lessened in order to foster best practices and make the work of scientists the benchmark as India embarks on an uncertain future.

Moreover, considering the limitations of study in the form of smaller sample size, use of only qualitative methodology and lack of sufficient empirical literature in the area, it is also proposed that new researches should be conducted in this area so as to include mixed methodology of qualitative and quantitative nature of data. The researches on larger samples drawn from different heterogeneous organizations are called for because those are likely to provide crucial research and organizational inputs to more specifically pinpoint the predictors of professional obsolescence in government R & D organizations, which in turn will help devise strategies to check obsolescence and keep people updated with the rapidly growing and changing organizational demands and scenarios.

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