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Correlates of Professional Obsolescence among Researchers

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ABSTRACT

Obsolescence setting in the employees of the organisations significantly hampers the organisational productivity. An empirical investigation of the associated factors and the efforts to minimise them help in designing strategies to deal with obsolescence and maintain optimum effectiveness of the organisation. As an attempt in this direction, the present study aimed at exploring the role of literature-suggested correlates of obsolescence in case of researchers in an Indian government organisation. The sample included 200 participants (146 males and 54 females) working as researchers in government scientific institutions with service experience ranging from two to 30 years. The participants were administered with standardised measures of obsolescence, work engagement, work motivation, resistance to change, organisational climate, human resource management (HRM) Policies and Practices, and Self Esteem. The obtained data were analysed with correlation and regression analyses. The findings revealed that in the target population obsolescence due to both organisational and individual level factors was found significantly and positively correlated with amotivation and resistance to change; whereas, negatively correlated with work engagement, organisational climate, HRM policies and practices, intrinsic motivation, and self-esteem. Regression analyses indicated that adequate recognition of efforts, better training and development, qualitative work availability (pressure), and enhanced concern to optimally maintain the intrinsic motivation and dedication of employees are significant factors for keeping check on obsolescence. The findings are explained and discussed in details.

Keywords: Obsolescence; Work engagement; Work motivation; Organisational climate

1. INTRODUCTION

To perform their roles and responsibilities effectively, individuals need to update themselves constantly in the era of vastly expanding knowledge base and rapid technological advancement. The exponential rate of scientific and technological progress implies that knowledge becomes obsolete at an accelerated pace if not updated accordingly. As professionals create, develop, and work with technology, they themselves need to be engaged in continuous learning throughout their career to stay updated. Otherwise, the threat of professional obsolescence is always surrounded around the professionals. Obsolescence has been defined as "the degree to which organisational professionals lack the up-to-date knowledge or skills necessary to maintain effective performance in either their current or future work roles"[1]; or, more broadly to include decrease or depreciation of human capital in terms of professional knowledge, ability, skills, attitudes and the like, required for continued successful performance[2,3]. Accordingly, since beginning different categorisations or typologies of obsolescence have also been made such as skill obsolescence, ability obsolescence, attitudinal obsolescence and so on[2]. The notions vary across the literature and no single source may be found to address the issue of human obsolescence in entirety and its causes.

Considering the nature and origin of obsolescence, Neuman & Weiss[4] have differentiated between internal and external depreciation of human capital. Internal depreciation is attributed to the employee himself and external depreciation is considered caused by external factors. Likewise, the causes of obsolescence may be individual related factors, work-related factors, and/or organisation-related factors. Kozlowski & Farr[5] have hypothesised that individual characteristics and organisational surroundings influence the performance and the updation or obsolescence process and are mediated by job characteristics and updating climate perceptions of the employees. Kaufman's[6] systems model attributes the causes of obsolescence to individual characteristics including self-esteem and motivation, nature of work, organisational climate, and above all the surrounding psychological environmental changes. Aryee[7] posited that along with individual characteristics, organisational policy has a significant relationship with obsolescence and these factors have significant relationships with motivation as well, thereby motivation serving as a moderator. Individual factors may include perception and motivation and organisational factors include nature of job, organisational climate and changes in the external environment[3,7]. Some Indian researchers[8,9,10] have

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also have also asserted that on the organisational front factors like job overload, lack of autonomy, non-involvement, lack of support and trust, organisational climate, lack of appropriate organisational policies and practices including ineffective performance appraisal system, lack of reward/recognition, and inappropriate promotion policies are the causes of obsolescence among the employees. Though assertions of the researchers are indicative of similar notions, empirical support severely lacks abundance and more specifically so in case of government organisations where change or updation of the organisational climate aspects and policies and practices takes much longer.

2. OBSOLESCENCE IN GOVERNMENT ORGANISATIONS

The phenomenon of obsolescence exits in varied forms in government organisations. Varied nature of roles and probable role confusion or conflict related issues, motivational issues, various procedures and practices, nature of communication prevalent in the organisation, concern for individual employees' training and development need and so on are the factors that may be associated with setting up of obsolescence among employees[8,9,11]. These factors may be different in different type of organisations and different types of works within the organisation.

Organisational Factors: The prevailing psychological climate of the organisation and human resource management policies and practices adopted by the organisation have been often suggested to be associated with employees productivity and obsolescence[3,9,12-15]. In an empirical study on Dutch government employees, Van Loo[16] found that education level, kind of occupation and sector of employment impact skill obsolescence; and better training and employability policies and continuous investment in human capital may counter the obsolescence. The training and knowledge updation may be more important in a research organisation which might often not be given the required level of attention in a government set-up. Rapid technological advances might lead to skill obsolescence of government professionals[17]. Training practices leading the researchers perform better on their desired goals will make them put in more efforts and remain enthusiastic[18].

Performance appraisal process and it's fairness in government organisation may also be associated with obsolescence[9]. Along with internal motivation, external motivating factors like due recognition of one's efforts, incentives and rewards are also linked with employee performance[19]. A sense of getting duly recognised or rewarded for remaining up to date and performing correspondingly[20], job autonomy and trust of the organisation in an employee for the completion of given tasks keeps the employees motivated and hence negatively correspond to setting up of obsolescence. In a very recently conducted qualitative study on government employees in a government research and development organisation, the authors and their colleague found various procedural issues, role related issues, motivational issues, and policies related issues to be associated with obsolescence[15]. Procurement processes, training, recruitment, performance appraisal, roles and responsibilities, autonomy, and motivating factors were the underlying specific variables affecting individual performance and morale and thereby linking with obsolescence[15].

Individual Factors: Along with organisational factors of climate and human resource practices, many individual factors have also been linked with obsolescence by various scholars. These factors primarily include work engagement[21,22], work motivation[3,7,9], resistance to change[23,24], and self-esteem[8,12,25]. The prevalence of these variables as correlates of obsolescence in government organisation has been supported recently by Singh, Mukherjee & Kumar[15]. Following the suggested association of these with obsolescence, it becomes imperative to extend empirical works with their inclusion as independent variables.

Many of the above discussed organisational as well as individual related variables have been frequently linked with professional obsolescence. However, considering the case of government organisations and moreover the research population therein, there is a considerable paucity of empirical works in India as well as across the globe about the individual and organisational factors associated with obsolescence. In this direction, the present study is an attempt to understand how the literature suggested correlates of obsolescence hold in case of research population in an Indian government organisation. The specific objectives of the research include – i) studying correlation of obsolescence with work engagement, work motivation, human resource policies and practices, psychological climate of the organisation, resistance to change, and self-esteem; and, ii) studying predictive role of these variables in determining obsolescence among employees. It was hypothesised that – i) work engagement, intrinsic motivation, self-esteem, psychological climate, and human resource policies and practices will correlate negatively with obsolescence in such a way that the better they are the lesser is the obsolescence; and, extrinsic or amotivation and resistance to change will correlate positively with obsolescence; ii) Some aspect of each of these variables will significantly predict obsolescence. The methodology to test the hypotheses is as in proceeding section.

3. METHOD

3.1 Participants

The participants of the study included 200 (146 males and 54 females) researchers working in different scientific institutions in a government organisation in India. The participants were drawn from the institutions located in different regions of the country using purposive stratified random sampling. The age of the participants ranged from 27 to 56 years with a mean of 41.5 years. The work experience ranged from 2 to 30 years ranging from junior to senior managerial levels. Having drawn from different regions, the participants basically hailed from varied cultural and social backgrounds.

3.2 Measuring Instruments

1. *Professional Obsolescence Scale*[9]: The scale taps obsolescence at two levels encompassing individual factors and organisational factors. A composite of the two has been taken as a measure of overall obsolescence. The authors have reported a reliability coefficient of .70

for the scale.

2. *Utrecht Work Engagement Scale*[26]: The scale measures three components of work engagement namely vigour, dedication and absorption. The authors define engagement as a positive and fulfilling state of mind and opposite to burnout. The internal consistencies for the scale range between .88 and .95, and it has been reported correlating negatively with measures of burnout.
3. *The Multidimensional Work Motivation Scale*[27]: The scale taps five dimensions of work motivation including amotivation, extrinsic regulation (social and material), introjected regulation, identified regulation, and intrinsic motivation. The coefficient alphas of reliability for the English version of the scale range from .70 to .90. In the present study only amotivation, extrinsic material regulation, and intrinsic motivation were included.
4. *Rosenberg Self Esteem Scale*[28]: The scale is based on the assessment of self-esteem through self-evaluation of positive and negative feelings about oneself. The scale has internal consistency reliability of .88 and test-retest reliability .85 over a period of two weeks and has shown high concurrent validity.
5. *Resistance to Change Scale*[29]: The scale measures an individual's dispositional inclination to resist changes. It taps four factors namely routine seeking, emotional reaction to imposed change, cognitive rigidity and short term focus. Total scales reliability coefficient alpha has been reported as .92 with the coefficient alphas for the subscales ranging from .68 to .89.
6. *Human Resources Management Policies and Practices Scale*[30] (HRMPPS): The HRMPPS includes six subscales namely, recruitment and selection, involvement, training development and education, work conditions, competency based performance appraisal and compensation and rewards. The reliability coefficients for the scale range from .81 to .93. Only the first five subscales made the part of present study.
7. *Inductive Measures of Psychological Climate*[31] *:* The instrument measures eight dimensions of organisational climate including autonomy, cohesion, trust, support, pressure, recognition, innovation, and fairness. Coefficient alphas for the scale range from .80 to .89. Fairness dimension was excluded for present study considering an overlap with another human resources management practices variable.

3.3 Procedure and Analyses

The participants were contacted through personal liaison and their informed consent was obtained for participation in the study after telling them the primary objective. The data were collected through the above-mentioned standardised instruments in hard copies. Personal identities were not asked for maintaining the anonymity and genuineness of data. The collected data were scored using the standard scoring as suggested by the authors of the instruments. Higher score indicates higher level of the construct and vice-versa. The obtained data were statistically treated with SPSS 21.0 and were subjected to descriptive statistics for analysis of distribution of scores, correlational analysis for seeing the associations of obsolescence with hypothetically correlated variables, and stepwise multiple regression for checking the predictive role of associated variables in determining obsolescence.

4. RESULTS AND DISCUSSION

The statistical analyses based findings of the study are briefly explained in the following sections.

4.1 Descriptive Statistics

The dispersion of the scores on various measures was assessed by computing means, standard deviation, skewness and kurtosis. Table 1 presents the obtained descriptive statistics.

The mean scores of various variables and a look at them from an explanatory point of view, it is evident from the findings that as per the norms the obtained mean scores on obsolescence are on the lower side[9] and the target population is

Table 1. Descriptive statistics

Variables and their sub-dimensions		Mean	Std. deviation	Skewness	Kurtosis
Obsolescence	Organisational factors	36.905	9.721	.210	.360
	Individual factors	35.995	8.981	.585	1.785
	Overall obsolescence	72.900	16.584	.545	2.006
Work engagement	Vigour	23.460	3.464	-.584	.804
	Dedication	20.815	3.716	-1.434	2.985
	Absorption	23.990	3.795	-.921	2.464
Work motivation	Amotivation	3.540	1.329	2.966	8.722
	Extrinsic regulation	5.070	2.565	1.254	1.040
	Intrinsic motivation	11.800	2.904	-.949	.639
Human resource policies and practices	Recruitment & selection	21.035	3.698	-.215	.538
	Involvement	42.015	8.769	-.606	.564
	Training & development	22.350	4.045	-.503	.357
	Work conditions	21.520	4.152	-.567	.034
	Perform appraisal	16.675	4.481	-.472	.273
Psychological climate	Autonomy	19.380	3.491	-.545	.096
	Cohesion	16.890	3.491	-.256	.514
	Trust	19.385	4.047	-.730	.459
	Pressure	13.610	3.017	.100	-.547
	Recognition	17.075	3.560	-.587	.210
	Support	18.645	4.696	-.662	-.003
	Innovation	17.835	4.816	-.755	.207
Resistance to change	Routine seeking	11.705	2.890	-.175	.175
	Emotional reaction	11.305	3.094	-.319	-.436
	Short term focus	9.800	3.175	.069	-.301
	Cognitive rigidity	13.655	2.395	-.136	.153
Self esteem		39.355	5.565	-.489	.360

not obsolete. Similarly, the sample has provided high scores on work engagement scales of vigour, dedication and absorption. Considering the case of work motivation, the sample has scored high on intrinsic motivation, low on extrinsic regulation, and very low on 'amotivation'. The mean score on self-esteem shows that the target population possesses high self-esteem in general. Autonomy, Cohesion, Trust, Recognition, Support, and Innovation aspects of psychological climate prevalent in the organisation have also been rated favourably, however pressure (availability of quality work) has been rated moderately. The scores on the aspects of resistance to change are centred around moderate level.

Keeping in view the normalcy of the score distribution, it is considered that the values of skewness less than ± 2 and kurtosis less that ± 3 are acceptable for a univariate distribution to be normal[32]. Going by this assertion, the scores on all the scales, except 'amotivation', fall within the acceptable limits. On 'amotivation' the scores are significantly positively skewed (Sk = 2.966) and are concentrated together at the lower end of the normal probability curve (Ku = 8.722). This finding suggests that in general there is no lack of motivation in the target population. Though not significantly diverging, the skewness coefficient on extrinsic regulation (Sk = 1.254) is also indicative of people having relatively low extrinsic regulation and are therefore internally dedicated to the organisation rather than particularly looking for materialistic gains for their efforts. This finding gets supported by the fact that on 'dedication' majority of the participants seem to score higher than mean with a negative skewness coefficient (Sk = -1.434) scores on rest of the variables are in general normally distributed for consideration for further analyses.

4.2 Correlations

In tune with the title objective of the paper, bivariate product moment intercorrelations among the study variables were computed. Keeping the discourse within the gamut of the objectives, the sorted correlation coefficients of all other variables with overall obsolescence as well as its organisational and individual factors are presented in Table 2.

Interestingly, almost all the variables have correlated significantly with both organisational and individual factors of obsolescence as well as with overall obsolescence. The pattern of correlation is consistently same for the variables in a way that the variable that bore significant correlation with organisational factors also bore significant correlation with individual factors as well as the overall obsolescence. All three aspects of work engagement that is, vigour, dedication and absorption were found to have significant negative correlations with obsolescence, the extent of correlation being relatively higher with individual factors and lower with organisational factors. It indicates that the higher the work engagement, the lower the obsolescence. It can be inferred that the researchers with higher levels of personal vigour, dedication to the job and organisation, and absorption are less likely to be obsolete. On the contrary, as the work engagement aspects are more of individualistic and personal attributes of an individual, it can be said that the employees with lower levels of these attributes have higher probability of getting obsolete. Hence, organisation's concern should be towards initiating the measures that help enhance work engagement.

Looking at the aspects of work motivation, the findings showed that amotivation correlated significantly and positively, and intrinsic motivation correlated significantly and negatively with obsolescence, whereas extrinsic regulation was not found to bear any significant correlation. It makes it clear that the higher the amotivation among employees, the higher is the probability of them getting obsolete; and, the higher the level of intrinsic motivation, the lower the probability of obsolescence. Although the present population has not shown so much inclination to materialistic aspects which can affect their performance, the organisation's focus should be centred on adopting the strategies that would keep the employees intrinsically motivated.

The results brought out that all the components of human resource management policies and practices were bearing significant reverse associations with obsolescence and its sub-components. Involvement dimension showed maximum

Table 2. Intercorrelations of variables with obsolescence and its components

Variables		Obsolescence		
		Organisational factors	Individual factors	Overall
Work engagement	Vigour	-.276**	-.430**	-.395**
	Dedication	-.336**	-.559**	-.500**
	Absorption	-.234**	-.385**	-.346**
Work motivation	Amotivation	.213**	.325**	.301**
	Extrinsic regulation	.055	.057	.063
	Intrinsic motivation	-.267**	-.442**	-.396**
Human resource policies and practices	Recruitment & selection	-.343**	-.257**	-.340**
	Involvement	-.552**	-.361**	-.519**
	Training & development	-.481**	-.413**	-.506**
	Work conditions	-.471**	-.325**	-.453**
	Perform appraisal	-.463**	-.217**	-.389**
Psychological climate	Autonomy	-.247**	-.401**	-.362**
	Cohesion	-.455**	-.258**	-.406**
	Trust	-.516**	-.331**	-.481**
	Pressure	-.077	-.042	-.068
	Recognition	-.562**	-.421**	-.557**
	Support	-.592**	-.342**	-.532**
	Innovation	-.591**	-.363**	-.543**
Resistance to change	Routine seeking	.180*	.294**	.265**
	Emotional reaction	.276**	.278**	.312**
	Short term focus	.146*	.306**	.251**
	Cognitive rigidity	.039	-.121	-.043
Self esteem		-.229**	-.476**	-.392**

** Correlation is significant at .01 p-level; * Correlation is significant at .05 p-level.

degree of association followed by training and development, work conditions, performance appraisal, and recruitment and selection. The inference drawn would be that poor policies on these aspects may instil a sense of demotivation among the employees thereby leading to obsolescence, while better practices will encourage the employees to continuously progress professionally.

The analysis of data revealed that except 'pressure' all other aspects of organisational climate (i. e., autonomy, cohesion, trust, recognition, support, and innovation) were found to have significant negative correlations with obsolescence. Since the independent variable is organisational, the extent of correlation' coefficients was relatively higher with organisational factors and lower with individual factors of obsolescence. The highest degree of correlation was with support followed by innovation, recognition, trust, cohesion, and autonomy, respectively. Such pattern of correlation points towards the specific significance of every aspect. Availability of organisational support, opportunities of practicing creativity in terms of innovative works, appropriate recognition of employees' contributions are the most significant aspects to keep the employee professionally growing and contributing to the organisation to their best. Further, it was found that resistance to change including its aspects of routine seeking, getting emotionally affected by change, and having short term focus were positively and significantly associated with obsolescence and its sub-components. Cognitive rigidity was not found to be correlated with obsolescence. It indicates that to excel and progress professionally and to significantly contribute to the organisation, an individual should be open-minded to accept change; and on the other hand, resistance to change will obstruct the productivity which will further lead to obsolescence. Lastly, the data revealed a significant negative association between self-esteem and obsolescence. The higher the self-esteem one possesses the lesser is the probability of he being professionally obsolete. Hence, organisations should work towards optimally maintaining the positive image of employees.

4.3 Multiple Regression

In an attempt to understand the predictive role of the independent variables in explaining variance in obsolescence, stepwise multiple regression was run taking organisational factors, individual factors and overall obsolescence as dependent variables. Table 3 concisely presents the regression summary of the three analyses and the regression coefficients entered in the final step of each of the regression equations for the three dependent variables.

The independent variables significantly accounted for 50 percent variance (R^2 = .50) in organisational factors

Table 3. Regression analyses

	Dependent variable		R	R^2	Adjusted R^2	Std. Error	F
Regression summary	Organisational factors		.71	.50	.48	7.00	31.76***
	Individual factors		.69	.48	.47	6.56	35.88***
	Overall obsolescence		.72	.52	.51	11.67	34.83***
				Unstandardised			
		Variables entered		B	Std. Error	Std. β	t
Regression coefficients	Organisational factors	Constant		68.30	3.92		17.41***
		Support		-.44	.17	-.21	-2.58**
		Involvement		-.27	.07	-.24	-3.62***
		Innovation		-.44	.17	-.22	-2.67**
		Emotional reaction		.41	.17	.13	2.47*
		Cohesion		-.35	.17	-.12	-1.99*
		Work conditions		-.33	.17	-.14	-1.99*
	Individual factors	Constant		85.92	3.98		21.56***
		Dedication		-.79	.15	-.32	-5.39***
		Self esteem		-.38	.09	-.24	-4.01***
		Training & development		-.29	.13	-.13	-2.16*
		Intrinsic motivation		-.50	.18	-.16	-2.72**
		Recognition		-.37	.15	-.15	-2.50*
	Overall obsolescence	Constant		149.94	8.36		17.94***
		Recognition		-1.45	.27	-.31	-5.37***
		Dedication		-.97	.26	-.22	-3.76***
		Training & development		-.96	.24	-.23	-4.07***
		Emotional reaction		.82	.29	.15	2.87**
		Intrinsic motivation		-.92	.32	-.16	-2.87**
		Pressure		-.67	.28	-.12	-2.38*

*** Significant at < .001 p-level; ** Significant at .01 p-level; * Significant at .05 p-level.

of obsolescence. Regression coefficients showed that the individualistic attributes of work engagement, motivation, and self-esteem did not emerge as significant contributors in organisational factors of obsolescence; and, the explained variance was accounted for by support, innovation and cohesion aspects of organisational climate, involvement and work conditions aspects of human resource management policies and practices, and emotional reaction aspect of resistance to change. The predictive direction suggests that betterment of the aspects of human resource policies and organisational climate leads to keeping control on obsolescence due to organisational factors; whereas, if some change affects the employees to the extent of emotional reaction, that leads to enhancement of organisational factors of obsolescence. In the individual level obsolescence, 48 percent (R^2 = .48; F = 35.88, p < .001) of variance was explained by dedication, self-esteem, training and development, intrinsic motivation, and recognition. As expected, three of the five predictor variables are individualistic, whereas only training and development and recognition are organisational. The reverse directional beta coefficients suggest that to avoid obsolescence it is necessary to create conditions for the improvement of these predictors. The findings seem to be consistent with the existing literature in the field. On taking overall obsolescence as dependent variable, it was found that 52 percent variance (R^2 = .52; F = 34.83, p < .001) in overall obsolescence among the target population would be explained by recognition and pressure availability of quality work) aspects of organisational climate, employees' dedication and intrinsic motivation, training and development aspect of human resource policies, and the changes igniting emotional reactions in employees. Hence, to keep the organisations and the employees in general obsolescence free, the efforts of the employees should be well recognised in appropriate form. They should be provided with sufficient quality work, efforts should be made to keep their dedication and intrinsic motivation high, their training and development needs should be adequately taken care of, and changes that may disturb them emotionally should be avoided.

5. CONCLUSIONS AND IMPLICATIONS

On the basis of data analyses and above explained results it could be seen that various aspects of work engagement, work motivation, organisational climate, human resource policies and practices, change resistance, and self-esteem are the significant correlates of obsolescence of employees at different levels. Some of these correlates independently play significant role in determining the setting or avoidance of obsolescence. These findings have strong implications in terms of providing insight to the government research organisations that the organisation should have such a climate and human resource policies which create conducive work conditions that provide a sense of support, cohesiveness, involvement, and innovation to the employees. Adequate training and development and appropriate recognition of their contributions are the imperative parts of these work conditions. The practices of the organisation should be facilitative to the sense of self esteem, intrinsic motivation and dedication among the employees. In order to maintain optimal productivity at organisational level and to ensure optimal professional growth of employees, organisations should regularly monitor the psychological climate and human resource management practices and policies. In addition, these should be continuously updated to be more conducive and suitable to the psychological and motivational needs of the employees. Also, government organisations should continue conducting such studies periodically specific to categories of workers to derive requisite inputs which will prove to serve the mutual ends of both the organisation as well as the employees. The data may even be analysed for specific sample characteristics for better insight of the employers to adopt requisite measure for enhanced productivity. Further, amalgamation of qualitative inputs with quantitative data will help provide promising results by bringing into focus the routinely bothering elements.

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