Influence of workforce agility on crisis management: Role of job characteristics and higher administrative support in public administration

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ARTICLE INFO

ABSTRACT

Crisis Management is a critical and challenging function across various forms of government. Crisis situations hardly give much time to the individuals and organizations for preparation. Accordingly, it is more likely that an agile workforce will better manage crisis in government organizations. This study explores the influence of workforce agility, on crisis management by government departments and examines the probable role of higher administrative support, and job characteristics over crisis management. Data were collected through a questionnaire survey from 263 government administrative officers of Odisha, India. Structural Equation Modelling was used to analyse the data with the help of AMOS. The results indicate that workforce agility, higher administrative support, and enriched job characteristics contribute towards better crisis management. Furthermore, higher administrative support, and enriched job characteristics were found to be antecedents of workforce agility and influence crisis management through the mediator workforce agility. The findings of this study will be helpful for government agencies and departments in creating an agile workforce for effective management of crisis.

1. Introduction

Crisis management (CM) is the systematic effort and cooperation to prevent or manage a crisis. The primary function in CM is to prevent, prepare for a crisis, manage the crisis to lessen the actual damage inflicted, and handle the post crisis situation [9]. CM is a critical and challenging function across various forms of government [6]. Different types of crises generate divergent challenges for administrators. Crisis situations hardly give much time to the individuals and organizations for preparation. If the administrators at the government departments can be proactive, adaptable and agile, a crisis can be managed better. Agility seems to be more relevant in this context as a crisis gives little time to respond. The ability to move quickly, easily and to be able to adapt with the changing scenario plays a crucial role. However, the influence of workforce agility seems to be affected by factors such as support received by an agile workforce from higher authority, and the nature and characteristics of the job. Accordingly, this study examines the influence of workforce agility on CM and explores the role of higher administrative support and job characteristics.

1.1. Background literature

Each crisis is unique and needs certain approach and intervention [20]. The effectiveness of CM can be judged from minimal negative impact of crisis on the individuals who are likely to be affected by the crisis. CM can be differentiated as pre-crisis phase, crisis phase and post-crisis phase. The Pre-crisis management involves predicting and detecting the crisis, its prevention, and preparation for facing the crisis. The crisis phase involves with responding to the challenges arose by the challenge. The post-crisis management involves with learning from the current crisis for the future [9]. The crisis response must be fast and accurate. Considering the uniqueness of every crisis, the government offi-

cials must be flexible and resilient to face any eventuality during crisis. Crisis period tests the capability of the government officials in terms of decision making and quick action to minimize the effect of the crisis. Crisis situations demand tough and contingent action from the officials in a short time span. Higher level of coordination is required among various government departments to manage and mitigate the adverse impact of the crisis. Most often, the prime responsibility of the government officials is damage containment, restoration, and recovery to normal situation in shortest possible time. They prepare strategic measures to minimize the negative impacts of future crisis. Post-crisis is period of post-mortem, analysis, learning, and building up new insight into risk and its evasion (Reynolds and Seeger, 2005).

1.2. Workforce agility

Workforce agility refers to the ease, flexibility, and quickness of an organisation's workforce to face the changes in the environment, to adapt an unpredictable and uncertain environment and respond to it positively [7,28,8]; Taylor & Haneberg, 2010). An agile workforce is proactive, adaptive, resilient. and generative (Dyer & Shafer, 2003). Agile workforce has a positive mindset for learning and self growth. They have good analytical and problem solving skills. They take risk, experiment, and initiate new action as per the context. So, such workforce can manage a crisis situation in a better manner. Proactive employees believe in continuous learning to perform their job in a better manner and constantly scan the circumstances for opportunities and threats [36], foresee problems in a crisis situation and initiate actions for their solutions. They are good at planning, setting, and prioritising goals. So in crisis situation, they believe in prompt action rather than reacting to it. They plan early to avoid last hour preparation before the crisis. They set deadlines to enhance their efficiency and prevent procrastination. Proactive people have a sense of direction to achieve any goal. It empowers them to apply all their knowledge and skills towards better CM [13]. Adaptability is the ability and motivation of a person to handle ambiguity, deal with uncertainty, and change to better fit to the changing environment [26,17]. Adaptability enables to take up multiple roles to perform in different tasks simultaneously (Dove & Willis, 1996). Such employees learn multiple competencies and they are flexible for multi-tasking in various teams [33]. As a quick, and early response generates greater impact, in crisis (Arpan & Rosko-Ewoldsen, 2005), such situation needs flexible employees to manage them [18]. Resilience refers to the ability to sustain in adverse conditions, and bounce back to the previous normal with more strength and vigour [30]; Seligman, 2011). Resiliency is a work attribute to perform under high stress and complex environment (Sherehiy et. al., 2007). Positive attitude towards change, tolerance of uncertainty and unexpected conditions, acceptance of variation in opinion are qualities of resilient employees [2]. As a crisis situation is complex, unpredictable and volatile, the workforce agility can be very crucial. This indicates that an agile workforce will better manage a crisis than a workforce with lesser agility. Accordingly, we propose the following hypothesis:

H$_1$: Workforce agility positively influences crisis management.

1.3. Job characteristics

Job characteristics Model [15] talks about job characteristics such as skill variety, task identity, task significance, autonomy, and feedback as potential motivators on the job that provides meaningfulness to the work. Skill variety refers to the wide range of skills required in the work. Non-routine, and non-repetitive jobs motivate employees [35]. Employees having experience and exposure in multi-skilled jobs can perform well in crisis situation.

Government employees would feel their job as meaningful if they use different set of skills in performing their job and in fulfilling the needs of various stakeholders. Crisis situation requires different skills among employees. They have to perform varied task, work with different people, and complete many group activity. This helps the workforce to make the maximum use of their agility and manage the crisis. Task identity is the degree of identification with a task or job. It helps in directing the efforts towards the goals and increases the responsibility and accountability of the employees that is required in a crisis situation. Employees consider their job as meaningful and worthwhile. Task significance is the positive feeling of the employee regarding the impact of his work on the lives of people and organisation. Task significance leads to job satisfaction, personal initiatives, helping attitude, and job performance [29]. When employees see that their job brings change in the life of people, they feel satisfied and extend more efforts, engagement, and involvement in their job. During crisis, employees can clearly see the impact of their work on the life of the people and the benefits people get due to such efforts that propel them to put their effort to manage crisis. Autonomy refers to degree of freedom, independence, and discretion in decision making [15]. In crisis, employees have to work immediately to manage the critical situations. Job autonomy and employee empowerment facilitate problem-solving, induce intrinsic motivation and productivity [31]. Feedback gives clear information about the performance of employees. Employees can better monitor and regulate the work by timely feedback (Nicol & Macfarlane-Dick, 2006). Feedback heightens the awareness and responsiveness of government officials in crisis situations. Thus timely and positive feedback is more likely to boost up the effort and efficiency of government employees in crisis situations. Beyond the characteristics identified by Hackman and Oldham [15], Job complexity is a characteristic that is more likely to influence the job outcome in line with the above job characteristics [12,34]. Job complexity refers to the multifacetedness of the job and indicates to what extent the job is demanding and challenging in nature [22]. Job complexity propels for independent judgement, creativeness, and originality in performance [25].

Enriching job characteristics are more likely to infuse positive attitude, intrinsic motivation promote job satisfaction, self-esteem, and problem solving in employees. When employees perceive their job as meaningful, they use a variety of skills to perform the job. Employees feel responsible for the outcomes and so focus on doing the work efficiently [37]. This indicates enriched job characteristics will induce better CM. Accordingly, we propose the following hypothesis.

H$_2$: Job characteristics positively influences crisis management.

1.4. Higher administrative support

In government set up, all instructions, decisions, and procedures flow from higher administrative machinery to the bottom level operational employees. Therefore, higher administrative support (HAS) is needed for the government employees managing crisis situation. Crises of different size, duration, and complexity have raised importance of HAS in managing them and providing security to citizens [19,21]. Crisis situation demands clear leadership, responsibilities, and direction, and therefore, HAS is of utmost importance in this context. Absence of HAS can create chaos and incompetency and rigidity and non-responsiveness among the subordinates [23]. On the contrary, HAS can promote employee empowerment and autonomy for better CM. From the above discussion, we propose the following hypothesis.

H$_3$: Higher administrative support has a positive effect on crisis management.

The above literature supports a direct and positive influence of workforce agility, HAS and Job characteristics over CM. However, it also indicates that there might be a positive relationship between HAS and workforce agility, and between Job Characteristics and workforce agility where HAS and Job Characteristics are probable antecedents of workforce agility. Furthermore, from the literature, we have already proposed that workforce agility has a positive association with effectiveness of CM. Hence, there is an indication that workforce agility might be playing the role of a mediator to pass on the influence of job characteristics and HAS over to CM. On the basis of this argument, we propose that

H$_4$: Workforce agility will mediate the influence of job characteristics and HAS over crisis management.

Accordingly, the following conceptual model was proposed for investigation (Fig. 1).
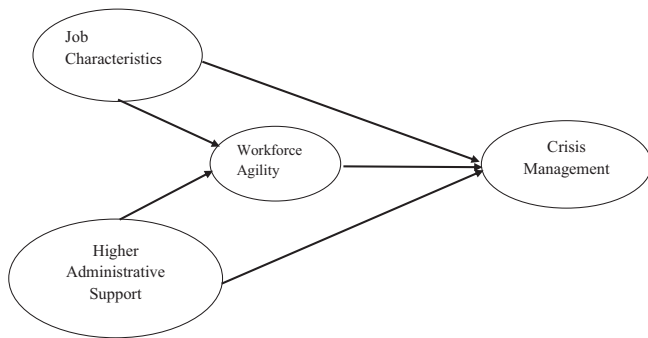

Fig. 1. Conceptual Framework for investigation.

2. Method

A questionnaire survey was conducted by the authors to collect responses for the purpose of testing the hypotheses.

2.1. Participants

Data were collected from officials of various government administrative officers of Odisha,India. Out of 325 questionnaires distributed, 263 valid responses were received. Out of the 263 respondents, 48 were women, and 215 (81.7%) were men. Age of the respondents varied from 25 to 64 years with a mean 41.7 and standard deviation 7.8 indicating that the respondents were from across different age groups. All the respondents are with qualifications of graduation and above with experience varying from 1 to 35 years of service in the government departments. 46 respondents were graduates, 208 were post graduates where as 9 respondents were holding PhD degrees in various areas of specialization.

2.2. Measures

Along with the demographic details, the questionnaire included scales to measure CM, Workforce agility, and HAS. The respondents were requested to respond to the questions and return the questionnaire to the authors.

2.3. Crisis management

A 18 item scale was developed for measuring the effectiveness of the CM in the government departments. The items were developed on 3 dimensions: Pre-Crisis Management, During Crisis Management, and Post-Crisis Management. 7 items are on Pre-Crisis Management, 6 items were on During Crisis Management, and 5

items were on Post-Crisis Management behaviour of their team. The items were on a 7-point Likert scale with response categories: 1 = Strongly Disagree, 2 = Moderately Disagree, 3 = Slightly Disagree, 4 = Neither Disagree nor Agree, 5 = Slightly Agree, 6 = Moderately Agree, 7 = Strongly Agree. When the responses were analyzed using confirmatory factor analysis, all items loaded on respective dimensions significantly with standardized factor loading ranging from 0.50 (p <= .001) to 0.91 (p<= .001). The poorly loaded item with standardized factor loading < 0.60 was dropped. The revised 3-factor model has all the items with factor loading greater than 0.60 (0.66, p<=0.001–0.91). It indicates a good convergent validity. The model has acceptable fir indices with χ2 /df = 4.04, CFI = 0.92 , RMSEA = 0.10. acceptable internal consistency (Cronbach's alpha = 0.91–0.93). The three factor model was then converted to a second order latent variable with three indicators representing Pre-Crisis Management, During Crisis Management, and Post-Crisis Management. The second order model had all items loaded significantly.

2.4. Workforce agility

To measure workforce agility, 39 items were taken from the Workforce Agility scale [32]. The scale was given to three experts in the field. Upon the suggestions of the experts, 20 items were dropped and the scale was reduced to 19 items. The 19 items were on three dimensions: proactivity, adaptability, and resilience. The dimension proactivity had 5 items, adaptability had 10 items and resilience had 4 items. All the items are on a 5-point Likert scale. The response varied as 1 = Never, 2 = Rarely, 3 = Occasionally, 4 = Often, and 5 = Always. Confirmatory factor analysis was conducted on the response to the 19 items with the previously conceptualized three factors. All the items were found to be loaded significantly on the respective dimension. The standardized factor loading was ranging from 0.46 (p <= .001) to 0.89. The poorly loaded items with standardized loading lower than 0.60 were dropped from the scale. Accordingly 2 items from proactivity and two items from adaptability were dropped. When the model with the remaining items were rerun, all the items had standardized loading greater than 0.60 (0.62, p < 0.001, 0.86). The model had acceptable fit indices (χ2 /df = 2.83, CFI = 0.92 , RMSEA = 0.08) and internal consistency of dimensions (Cronbach's alpha = 0.80–0.89). The three factor model was then converted to a second order latent variable with three indicators representing proactivity, adaptability, resilience. The second order model had all items loaded significantly.

2.5. Higher administrative support

To measure Higher administrative support, 11 items were developed by the authors in consultation with subject area experts, public policy experts, and administrators. The items were on a 5-point Likert scale. The response range varied as 1 = Never, 2 = Rarely, 3 = Occasionally, 4 = Often, and 5 = Always. When confirmatory factor analysis was carried out, all the items loaded on a single factor significantly. The standardized factor loading was ranging from 0.49 (p <= .001) to 0.82. The poorly loaded items with standardized loading lower than 0.50 were dropped from the scale. Accordingly, three items were dropped. The revised model had all the items with standardized loading greater than 0.50 (0.50, p < 0.001, 0.86) and acceptable internal consistency (Cronbach's alpha = 0.89). The model had acceptable fit indices (χ2 /df = 3.46, CFI = 0.96, RMSEA = 0.09).

2.6. Job characteristics

The Job characteristics were taken from the Job Characteristic Model by [15,27]. In this study we have taken job characteristics

as a latent variable with five dimensions taken from the job characteristic model as skill variety, task identity, task significance, autonomy, and feedback and one dimension job complexity has been added to it. As the score on Job Characteristic increases, it indicates an enriched job profile that motivates individuals on the job [15,16]. The scale has four items on each: skill variety, task identity, task significance, autonomy, feedback, and job complexity. When confirmatory factor analysis was carried out, all the items were loaded on respective dimensions significantly. The standardized factor loading ranged from 0.25 (p <= .001) to 0.90. One poorly loaded item from task identity with standardized loading < 0.50 was dropped. The revised model had all the items with standardized factor loading greater than 0.50 (0.57, p <= .001 to 0.90). The dimensions has acceptable internal consistency (0.73, 0.80, 0.85, 0.89, 0.85 and 0.89) and the model had acceptable fit indices ($\chi2$ /df = 2.58, CFI = 0.88 , RMSEA = 0.07). The six factor model was converted to a second order latent variable with six indicators representing each dimension. However, all the items were loaded significantly on the second order latent variable except autonomy. Accordingly the autonomy was dropped from the final job characteristic second order model.

3. Results

To explore the causal relationship, and test the hypotheses, structural regression analysis was carried out with the help of AMOS software. Four models were tested to test the four hypotheses.. In the First Model, the influence of Workforce Agility, Job Characteristics and HAS was tested over CM taking Workforce agility, Job Characteristics and HAS as independent variables and CM as dependent Variable. It was observed that workforce agility, HAS, and job characteristics positively influence CM significantly (Table 1: Model 1). The result supports hypotheses 1, 2, and 3.

In Model 2, we have taken Job Characteristics as independent variable, CM as dependent variable and Workforce agility as mediator variable between Job characteristics and CM (Table 1: Model 2). The mediation effect was calculated by dividing the indirect effect by the total effects of job characteristics on CM. The mediation effect was found to be 68.75% indicating a partial mediation by workforce agility (Table 2). The effect size was 0.33 which is categorized as *high* [5]. The Sobel Test statistics also indicate a significant Mediation by workforce agility (Table 2). In Model 3, the mediation effect of Workforce agility in the relationship of HAS and CM was tested. HAS was taken as independent variable, CM as dependent variable, and workforce agility as mediator variable (Table 1: Model 3). The mediation effect was found to be 22.39%

indicating partial mediation of the influence of HAS through workforce agility over to CM (Table 2) . The effect size was 0.15 which is categorized as *moderate* [5] and the Sobel Test statistics indicate a significant mediation by workforce agility (Table 2).

In Model 4, the complete conceptual framework was tested with job characteristics, and HAS as independent variable, CM as dependent variable and Workforce agility as mediator variable (Table 1: Model 4). It was observed that in the full model 20.64% of the effect of HAS is passing through WA which is similar to the mediation effect generated in model 3 and can be categorised as *moderate* [5]. The Sobel Test *statistic* confirm the significance of the mediation. However, 96.43% of the effect of job characteristics passed through workforce agility which is larger than the mediation effect found in Model 3. It can be categorised as *high* and indicates a full mediation. It was confirmed by Sobel test statistic (Table 2). It indicates that workforce agility fully mediates the effects of job Characteristic over CM. These findings support our hypothesis 4.

4. Discussion

The study examined the effect of workforce agility, HAS, and job characteristics on CM of government departments. The probable mediating role of workforce agility in the relationship between HAS and job Characteristic with CM has been explored. The results indicated that higher workforce agility, higher HAS and enriched job Characteristic contributes to better CM. Furthermore, it was observed that higher administrative support and enriched job characteristics in terms of skill variety, task identity, task significance, feedback and job complexity induces agility among the employees and an agile work force effectively manages crisis in comparison to the work force without higher administrative support and without enriched job characteristics. Earlier evidence has suggested that enriched job characteristics contribute to employee motivation, satisfaction and job performance. The finding of the paper is in line with the previous findings.

It was observed that HAS and job Characteristic act as antecedents of workforce agility which in turn induces effectiveness in CM. HAS provides that freedom to act, react, and empowers employees for taking any decision at their level. This enables employees to be agile. Similarly enriched job characteristics such as skill variety, task identity, task significance, feedback, and job complexity contributes to workforce agility. Variety of skills enables employees to be quick to respond and adapt to new situations contributing to higher agility. Task identity increases the responsibility and commitment towards the job, and employees

Table 1
Hypotheses testing through Structural Equation Modelling.

Model	Path	*B*	SEB	*β*	CR	*p*	Inference	Fit Indices
1	CM←WA	0.80	0.16	0.33	5.037	0.001	Supports Hypothesis 1	$\chi2$ /df = 4.1, CFI = 0.82 , RMSEA = 0.11
	CM← JC	0.25	0.10	0.15	2.57	0.01	Supports Hypothesis 2	
	CM←HAS	1.23	0.17	0.60	7.04	0.001	Supports Hypothesis 3	
2	WA←JC	0.52	0.07	0.66	7.74	***		$\chi2$ /df = 2.9, CFI = 0.93 , RMSEA = 0.10
	CM←WA	1.18	0.25	0.50	4.74	***		
	CM←JC	0.28	0.18	0.15	1.57	0.12		
3	WA←HAS	0.38	0.08	0.39	4.54	***		$\chi2$ /df = 3.7, CFI = 0.91 , RMSEA = 0.08
	CM←WA	0.95	0.17	0.39	5.77	***		
	CM←HAS	1.23	0.20	0.52	6.28	***		
4	WA←JC	2.21	0.81	0.60	2.73	0.01		$\chi2$ /df = 2.4, CFI = 0.92 , RMSEA = 0.07
	WA←HAS	0.31	0.08	0.30	4.07	***		
	CM←WA	0.97	0.23	0.44	4.15	***		
	CM←HAS	1.13	0.19	0.50	5.96	***		
	CM←JC	0.08	0.69	0.01	0.11	0.91		
Note	JC: Job Characteristics; HAS: Higher Administrative Support; WA: Workforce Agility; CM: Crisis Management; *B* : Un-standardized beta; SEB : Standard error of beta; *β* : Standardized beta; CR: Critical ratio; *p*: Probability

Source: Prepared by the authors

Table 2
Mediation Effect.

Model	Path	Mediation Effect	Effect Size	Percentage ofMediation	Extent of Mediation	Sobel Test *statistic*
2	**JC –> WA –>CM**	$0.66 \times 0.50 = 0.33$	High	$0.33 / (0.33 + 0.15) = 68.75\%$	Partial	4.03, p < .001
3	**HAS –>WA –>CM**	$0.39 \times 0.39 = 0.15$	Moderate	$0.15 / (0.15 + 0.52) = 22.39\%$	Partial	3.57, p < .001
4	**JC –> WA –>CM**	$0.60 \times 0.44 = 0.27$	High	$0.27 / (0.27 + 0.01) = 96.43\%$	Full	2.28, p < .05
	HAS –>WA –>CM	$0.30 \times 0.44 = 0.13$	Moderate	$0.13 / (0.13 + 0.50) = 20.64\%$	Partial	2.90, p < .01
Inference		Supports Hypothesis 4				
Note		JC: Job Characteristics; HAS: Higher Administrative Support; WA: Workforce Agility; CM: Crisis Management; *p*: Probability				

Source: Prepared by the author

get involved with job resulting in skillfulness, expertise and agility. Similarly, when employees feel their job as significant, it motivates them to perform productively. The intention and attitude for productivity is likely to be a significant factor propelling individuals to be agile as per the job and environmental demand. Feedback gives a scope for revision, correction, and improvement. Constructive feedback and a systematic feedback system make employees flexible, adaptable and learning. A flexible, adaptable, and learning workforce will be agile to manage crisis better. Job complexity challenges an individual, tests the potential, and pushes the limit of employees, making them creative, and unconventional and develop agility. Agile workforce are good at collaboration, cooperation, knowledge sharing, and empowerment and can handle uncertain and difficult situations. They initiate change, has a positive mind-set toward self-development; problem-solving, generation of new ideas, and acceptance of new responsibilities [28]. The ability to respond to changes in an effective manner in due time and the ability to exploit changes gives an advantage to an agile workforce to manage crisis effectively [4,1,14].

5. Conclusion

The respondents of the study are administrative officers in various government departments of Odisha, India, and gives a good representation of various age groups, qualifications, and experiences. The findings of this study will be helpful for government agencies and departments in creating an agile workforce for effective management of crisis. The study is not free from limitations. The data were collected taking individuals as unit of analysis. However, as management of crisis is primarily a team work, data from departments as unit of analysis would have strengthened the findings of the study. Second, the study has not taken the social desirable responding into consideration which might be present within the responses. Not withstanding the limitations, the study identifies two crucial antecedents of workforce agility and provides an empirical evidence of their influence in CM.

CRediT authorship contribution statement

Pradeep Kumar Raut: Writing – original draft, Software. **Jyoti Ranjan Das:** Validation, Writing - review & editing. **Jyotiranjan Gochhayat:** Conceptualization, Methodology. **Kalyan Prasad Das:** Visualization, Investigation, Supervision.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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