



**BRITISH ACADEMY  
OF MANAGEMENT**

---

**BAM**  
CONFERENCE

---

**3RD-5TH SEPTEMBER**

**ASTON UNIVERSITY BIRMINGHAM UNITED KINGDOM**

This paper is from the BAM2019 Conference Proceedings

**About BAM**

The British Academy of Management (BAM) is the leading authority on the academic field of management in the UK, supporting and representing the community of scholars and engaging with international peers.

<http://www.bam.ac.uk/>

## **Complexity Theory: A Pathway to Adapt to Electronic Hiring Processes.**

Ronald Markowski\* and Theresa A. Chika-James\*

MacEwan University, School of Business, Edmonton, AB, Canada.

Contact: Dr. Ronald Markowski  [MarkowskiR@macewan.ca](mailto:MarkowskiR@macewan.ca)  
Dr. Theresa A. Chika-James  [chikajamest@macewan.ca](mailto:chikajamest@macewan.ca)

## **Complexity Theory: A Pathway to Adapt to Electronic Hiring Processes.**

### **Abstract:**

Information technology with the introduction of electronic recruitment and selection tools have significantly influenced the process of hiring employees. While company websites, job boards and other social media sites such as LinkedIn have enabled organizations easily access potential job candidates, it has also created more challenges in determining appropriate technological means to hire the most talented candidate. Issues such as passive e-recruitment, discrimination, and breach of privacy are some contemporary challenges organizations face in adopting these technological means in the war for talent. With the evolving nature of information technology in delivery more change and complexity, it is pertinent that organizations continually adapt and best utilize electronic recruitment and selection tools to gain competitive advantage. This paper presents complexity theory as a guide to adapt to the evolving nature of electronic hiring processes. Using MacIntosh and MacLean (2001; 2006) conditioned emergence framework, the paper presents the need for organizations to create new order-generating rules, as well as feedback processes. It indicates the feedback process as a focal point in reinforcing new rules and approaches; and a means to evaluate electronic hiring process. The paper concludes with request for constructive suggestions to improve this study.

*Keywords:* e-recruitment, complexity theory, organizational change.

*Track:* Organizational Transformation Change and Development

*Word Count:* 2459 (excluding references)

## **Introduction**

With the increased use of technology to facilitate improved performance in organizations, human resource personnel in organizations have also turned to information technology such as electronic recruitment and selection strategies as means to attract and employ competent employees (Dulebohn and Johnson 2013; Stone and Deadrick 2015). Organizations, via this technological platform, have used the internet to construct persuasive messages while posting job adverts (van Esch and Mente 2018). In addition, it has been used to create online platforms to enable job seekers apply online and assess their applications (Dineen and Allen 2013; Melanthiou et al. 2015) with the intent that this approach to HR process is efficient and effective to select job applicants with diverse skills and competencies, saving cost and time of hiring (Dulebohn and Johnson 2013; Melanthiou et al. 2015). As indicated in related literature, e-recruitment is recognized as the fastest means to attract and identify potential employees, with evidential findings of 100 percent of large US organizations using some form of this technology for recruitment purposes (Harrison and Stone 2018). This paradigm shift in the use of technology has expanded the global scope for organizations to attract skilled employees, and also narrowed the reach to specific candidates as organizations craft and specialize messages on a per-job-seeker basis (Dineen and Allen 2013; Schwind et al. 2016). As organizations use this means to specify exact qualifications and job skills required for a job, job seekers also use this data to make informed decisions when applying for a job position (Dineen and Allen 2013; Schwind et al. 2016).

Interestingly, while e-recruiting presents benefits to both recruiters and job seekers, it also presents some challenges in attracting and selecting competent candidates (Bartram 2000; Maurer and Cook 2011; Ramkumar 2018). Identified challenges in adopting internet recruitment include selecting the e-recruitment tool to use (Melanthiou et al. 2015); understanding the timing for posting job advertisements, as well as the skill and time required to screen job applicants (Campos et al. 2018). Wrong selection of e-recruitment tool to use can result in receiving excess applicants, as well as both unrelated and related applicants. As Melanthiou et al. (2015) argues, wrong selection tool could also lead to receiving less job applicants than expected. On the timing for posting job advertisements, Campos et al. (2018) and Ramkumar (2018) studies indicate that the effectiveness of e-recruitment is subject to the number of online job seekers available at the time of the recruitment process. Noting that organizations may have limited control over this aspect, some HR practitioners are taking a new turn to use social media such as LinkedIn and other job board sites to recruit competent employees already working either with a competitor or an existing firm (see Dickins 2018). This passive e-recruitment process presents the additional challenge of screening social media platforms and job board sites for potential job candidates. With the additional high volume of job and social profiles to review; it is saddled on HR practitioners the tedious task of sifting through lots of information, 'like kissing frogs before you find prince' (Bartram 2000, p. 265) to assess the validity of the information presented to get the right candidate. Thus, contributing to the dark side of web recruiting (Dineen et al. 2007; Maurer and Cook 2011; Dineen and Allen 2013).

In addition to these challenges is the legality concerns over social profile screening of potential workers. Besides the contested issue of validating the accuracy of the social profile of a potential candidate, are ethical and legal issues of discriminating applicants and breaching the privacy rights

of candidates, such that discrimination and breaches on privacy can mar the reputation of the recruiting firm (Melanthiou et al. 2015). For instance, Bond (2018) and Feintzeig and Fuhrmans (2018) reports indicates that organizations recruiting skilled personnel in Europe through this e-recruitment tool could violate digital privacy laws under the new General Data Protection Regulation (GDPR) if adequate measures are not taken in the screening process. Breaching the privacy rights of potential candidates raises a further issue on creating a positive candidate experience during the hiring processes. As Miles and McCamey (2018) noted, the hiring process, if not executed in an effective way, can tarnish the reputation of the firm.

Based on the preceding information, it is understandable that technological changes in using e-recruitment and e-selection strategies poses some cost-effective benefits for organizations. However, it also incurs costly resources in terms of branding company image via the internet; designing career websites; creating recruitment software applications to capture the knowledge, skill and personality of candidates to fit with the job or the organization (see Dineen and Allen 2013). It also leads to more invested time and training of HR personnel to screen, respond and interview applicants via the internet (see Stone et al. 2015). It is notable that these technological changes, with the intent to enhance the HR processes of organizations to attract and retain competent workers, has also introduced complexity in the process. While most organizations use these innovative means, others dabble with the process with expectations to secure talented workforce. What is profound within related literature are inconsistencies on the effectiveness of e-recruitment and e-selection strategies in hiring the most talented applicants (Stone et al. 2015). We argue that the issue resides in the complexity and evolving nature of e-recruitment and e-selection strategies; as well as the different ways organizations use this platform.

To navigate through this complex situation, we argue that organizations would need to constructively adapt and manage e-recruitment and e-selection strategies. Noting that the process of adapting to new e-recruitment technologies is one of the top challenges in implementing e-recruitment in organizations (Kim and O'Connor 2009), we propose complexity theory (MacIntosh and MacLean 2006), as a theoretical lens to assist organizational members to manage and adapt to these new technological forms. This responds to the question: how can organizational members become more adaptive to the disruptive innovations of electronic recruitment and selection tools? In accordance with Miller and Tsang (2010), we reviewed the strengths and weakness of several theories that might best be applied to resolve this management dilemma. Our review indicated MacIntosh and colleagues (1999; 2006) complexity theory as best suitable in comparison to chaos and disruptive innovation theories (see Christensen 1997; Yu and Hang 2010). Through the theoretical lens of complexity theory, we propose that organizations can make attempts to understand and manage the challenges related to e-recruitment and e-selection strategies. In using MacIntosh and MacLean (1999; 2001; 2006) three step transformational process of (i) conditioning, (ii) creating far from the equilibrium conditions, and (iii) managing the feedback process, we show that organizations can make successful attempts in their HR processes in the face of complexity. We present further explanation of this theoretical framework with an illustration on implementation options. First, we briefly present explanation of complexity theory with an introduction of MacIntosh and MacLean (2006) 'conditioned emergence' framework. Second, we indicate the presentation of the framework, how it can be used to deal with the challenges of organizations transforming their HR process to electronic recruitment and selection.

## **Complexity Theory**

While there is no universal definition of complexity theory as it could relate to algorithmic, deterministic or aggregate complexity (Manson 2001); there is a general understanding that complexity theory is a scientific theoretical framework used to understand complex systems within different academic disciplines (Waldrop 1992; MacIntosh and MacLean 2006; Mason 2008). Proponents of complexity theory view the world as a messy, interconnected place where uncertainty and change dominate the landscape (MacIntosh et al. 2006; Boulton 2010). They contend against the ideology of a linear cause and effect relationship that will lead to a stable equilibrium. Rather, there is the operation of non-linearity, nonequilibrium and disorder that emerges from independent and interacting actors that, via their interconnectedness, create unpredictable futures (Brown and Eisenhardt 1997; Stacey 2006). However, it is noted that within the uncertainty and chaos, lies an emergence of order (Kauffman 1993). The emphasis here, is not so much ‘on the emergence of order from chaos, but on continual adaptation of systems on the edge of chaos’ (MacIntosh and MacLean 2006, p. 33). Thus, proponents suggest that organizations’ productivity and survival within complex systems, is the ability to keep adapting and changing by remaining at the ‘edge of chaos’, an abstract position between stability and instability (Brown and Eisenhardt 1997).

Further analysis of complexity theory indicate that within any system exists various and diverse agents or elements that are densely interconnected in different ways (MacIntosh et al. 2006; Boulton 2010). These agents or elements, within management and organization studies, could include managers, organizational members, suppliers, technological devices, other corporations, state agencies, trade unions, institutions, and the general public. The continual interactions of these agents or elements lead to radically new and unpredictable characteristics and approaches to work and organizations. Thus, this results to several possibilities of future outcomes; and while there is an understanding that the future is built from the past and present state of organizations (Palmer et al. 2017), as Boulton (2010) argues, ‘the future cannot be reliably predicted from the past’ (p. 33). This is indicated in contemporary times, within the context of HR processes of recruitment and selection, where the general public, as human agents, use the same e-recruitment platforms to question the hiring of executive personnel (Feintzeig and Fuhrmans 2018). In Feintzeig and Fuhrmans (2018) case, the public resorted to use the information posted on a tweeter account of a US executive to challenge the hiring process of a print media firm. This denotes a radical outcome of the continual interactions of agents and elements, that could not be predicted from past conventional recruitment processes. It is therefore significant for organizations to be adept to respond to the changes and challenges emanating from the use of these technological platforms to hire competent employees. A viable approach proposed is MacIntosh and MacLean (2006) transformation process: the conditioned emergence framework.

### **Conditioned Emergence Framework in Adapting to E-Recruiting.**

MacIntosh and MacLean (2006) study, in response to the evolving nature of complex systems, proposed the conditioned emergence framework with specific sequence of three stages that would aid in successful transformations in organizations. This includes the conditioning phase, creating or anticipating far-from-equilibrium conditions and managing the feedback processes. Based on

this framework, organizations in the conditioning phase need to understand deep structures or order-generating rules within the firm (Beech and MacIntosh 2017). This is herein, referred to as the culture of the organization. A clear understanding of the culture of the firm would aid in identifying its purpose embedded in its mission and vision statement. This will also inform understanding on its HR process, influencing both the type of workers recruited, as well as the recruitment process. This is a vital point prior to implementing or dabbling into organizational change as a result of technological factors. Next, MacIntosh and MacLean (2006) propose that organizations would need to create new order-generating-rules that are content and process oriented. These rules demonstrate details of what should be done and ways of conducting business. This new order-generating-rules are not totally distinct from previous culture, as they can include aspects of the old rules. As Moore and Sonsino (2003) stated, this process can be achieved through facilitated discussions and dialogue with organizational members on what aspect of the old rules to retain and others to reject. For instance, in the case of e-recruiting and e-selection, the new rule could include striving to hire the most talented candidates. This rule should be made explicit to inform all organizational members.

In the second phase of creating or anticipating far-from-equilibrium conditions, MacIntosh and MacLean (2006) propose organizations effect a sufficient departure from previous ways of executing business. This could include restructuring the organization by introducing cross-functional team structure. The intent is to ensure that organizations do not revert back to old rules. In the case for e-recruitment and e-selection, we propose that cross-functional teams to include staff from the HR department; managerial authorities and competent staff from the specific department that requires a new employee; personnel from the information technology unit, research and development, as well as legal department would need to collaborate as a team in conducting a job analysis and the process of hiring. While this could incur more time and expertise involved; we argue that using this approach would assist in making the e-recruitment and e-selection process effective. For instance, contributive information from the research team would aid in understanding the timing to recruit, provide information on current and assessible e-recruitment software to use; while members from the technology team offer advice on website designs.

In managing the feedback process, MacIntosh and MacLean (2006) proposed that organizations encourage positive feedback, as 'feedback...amplify actions consistent with the new rules and archetype' (p. 46). This does not negate the importance of negative feedback. But, we argue that such negative feedback can be presented as constructive expressions of challenges or disapproval. As noted in several change management studies, constructive criticisms aids in stimulating and sustaining innovation in organizations. The feedback process could include the reinforcement of the new rules and approaches towards using e-recruitment and e-selection; as well as brief presentation and documented reports that evaluates the e-recruitment and e-selection efforts. Interestingly, this aspect is the least considered as many organizations 'do not bother to ask these questions or evaluate the effectiveness of their recruiting efforts' (Catano et al. 2016, p. 269). With the evolving and complex nature of e-recruiting and e-selection, it is pertinent that organizations engage actively in the feedback process as this is central to the extent to which organizations can effectively utilize the system.

### **Conclusion and Future Development**

This study has highlighted contemporary issues related with e-recruitment and e-selection strategies organizations face. This includes determining the e-recruitment tool to use; understanding the timing for posting job advertisements and timing to screen job applicants; as well as dealing with ethical and legal issues over social profile screening of potential workers (Melanthiou et al. 2015; Campos et al. 2018; Ramkumar 2018). In view of the challenges, we propose complexity theory, specifically MacIntosh and MacLean (2006) conditioned emergence framework, as a theoretical lens to aid organizations respond to the evolving nature of electronic recruitment and selection strategies. While complexity theory reminds us that the future seems to be set on delivering more complexity and change; it also posits that these changes can actually be helpful to organizations if used effectively. While this study offers a more descriptive analysis, it would be beneficial to gain insightful recommendations to improve the research in areas such as generating ideas on new rules and valuable old rules to establish in organizations when hiring competent personnel; other approaches to reconfigure organizational structure; as well as feedback processes to consider that establishes new rules.

## References

- Bartram, D. (2000). Internet recruitment and selection: Kissing frogs to find princes. *International Journal of Selection and Assessment* 8(4), pp. 261–274.
- Beech, N. and MacIntosh, R. (2017). *Managing change: enquiry and action*. Cambridge: Cambridge University Press.
- Bond, S. (2018). A messy digital footprint can cost you a job. Available at: <https://www.ft.com/content/87cfe2ee-bfeb-11e8-84cd-9e601db069b8> [Accessed: 19 February 2019].
- Boulton, J. (2010). Complexity theory and implications for policy development. *Emergence: Complexity and Organization* 12(2), pp. 31–40.
- Brown, S.L. and Eisenhardt, K.M. (1997). The art of continuous change: linking complexity theory and time-paced evolution in relentlessly shifting organizations. *Administrative Science Quarterly* 42(1), pp. 1–34.
- Campos, R., Arrazola, M. and de Hevia, J. (2018). Finding the right employee online: determinants of internet recruitment in Spanish firms. *Applied Economics* 50(1), pp. 79–93.
- Catano, V. M., Wiesner, W. H., Hackett, R. D., & Belcourt, M. (2016). *Recruitment and selection in Canada*. 6th ed. Toronto, Ontario: Nelson Education.
- Christensen, C.M. (1997). *The innovator's dilemma: When new technologies cause great firms to fail*. Boston: Harvard Business Press.
- Dickins, S. (2018). Cardiff tech firm: 'We'll pay £100k, but can't get staff'. Available at: <https://www.bbc.com/news/uk-wales-45891002> [Accessed: 20 February 2019].
- Dineen, B. and Allen, D.G. (2013). Internet recruiting 2.0: Shifting paradigms. In: Yu, K. Y. T. and Cable, D. M. eds. *The Oxford Handbook of Recruitment*. New York: Oxford University Press, pp. 382–401.
- Dineen, B. R., Ling, J., Ash, S. R., & DeVecchio, D. (2007). Aesthetic properties and message customization: Navigating the dark side of web recruitment. *Journal of Applied Psychology* 92(2), pp. 356–372.
- Dulebohn, J.H. and Johnson, R.D. (2013). Human resource metrics and decision support: a classification framework. *Human Resource Management Review* 23(1), pp. 71–83.
- Feintzeig, R. and Fuhrmans, V. (2018). Past social-media posts upend hiring: employers grapple with screening job applicants' online personas, including years-old tweets. Available at: <https://www.wsj.com/articles/social-media-histories-upend-hiring-1533503800> [Accessed: 19

February 2019].

Harrison, T. and Stone, D.L. (2018). Effects of organizational values and employee contact on e-recruiting. *Journal of Managerial Psychology* 33(3), pp. 311–324.

Kauffman, S.A. (1993). *The origins of order*. New York: Oxford University Press.

Kim, S. and O'Connor, J.G. (2009). Assessing electronic recruitment implementation in state governments: issues and challenges. *Public Personnel Management* 38(1), pp. 47–66.

MacIntosh, R., MacLean, D., Stacey, R., & Griffin, D. (2006). *Complexity and Organization Readings and conversations*. New York: Routledge.

MacIntosh, R. and MacLean, D. (1999). Conditioned emergence: a dissipative structures approach to transformation. *Strategic Management Journal* 20(4), pp. 297–316.

MacIntosh, R. and MacLean, D. (2001). Conditioned emergence: researching change and changing research. *International Journal of Operations & Production Management* 21(10), pp. 1343–1357.

MacIntosh, R. and MacLean, D. (2006). Conditioned emergence: a dissipative structures approach to transformation. In: Macintosh, R. et al. eds. *Complexity and organization: Readings and conversations*, pp. 27–55.

Manson, S.M. (2001). Simplifying complexity: a review of complexity theory. *Geoforum* 32(3), pp. 405–414.

Mason, M. (2008). What is complexity theory and what are its implications for educational change? *Educational Philosophy and Theory* 40(1), pp. 35–49.

Maurer, S.D. and Cook, D.P. (2011). Using company web sites to e-recruit qualified applicants: A job marketing based review of theory-based research. *Computers in Human Behavior* 27(1), pp. 106–117.

Melanthiou, Y., Pavlou, F., & Constantinou, E. (2015). The use of social network sites as an e-recruitment tool. *Journal of Transnational Management* 20(1), pp. 31–49.

Miles, S.J. and McCamey, R. (2018). The candidate experience: Is it damaging your employer brand? *Business Horizons* 61(5), pp. 755–764.

Miller, K.D. and Tsang, E.W.K. (2010). Testing management theories: critical realist philosophy and research methods. *Strategic Management Journal* 32(2), pp. 139–158. doi: 10.1002/smj.

Moore, J. and Sonsino, S. (2003). *Leadership unplugged: the new renaissance of value propositions*. New York: Palgrave Macmillan.

- Palmer, I., Dunford, R., & Buchanan, D. (2017). *Managing Organizational Change: A Multiple Perspectives Approach*. New York: McGraw Hill.
- Ramkumar, A. (2018). E-Recruitment through job portals and social media network: challenges & opportunities. *Indian Journal of Public Health Research & Development* 9(6), pp. 143–418.
- Schwind, H., Uggerslev, K., Wagar, T. H., Fassina, N., & Bulmash, J. (2016). *Canadian Human Resource Management*. 11th ed. McGraw Hill Education.
- Stacey, R. (2006). The science of complexity: an alternative perspective for strategic change processes. In: Macintosh, R. et al. eds. *Complexity and organization: Readings and conversations*. New York: Routledge, pp. 74–100.
- Stone, D.L., Deadrick, D. L., Lukaszewski, K. M., Johnson, R. (2015). The influence of technology on the future of human resource management. *Human Resource Management Review* 25(2), pp. 216–231.
- Stone, D.L. and Deadrick, D.L. (2015). Challenges and opportunities affecting the future of human resource management. *Human Resource Management Review* 25(2), pp. 139–145.
- van Esch, P. and Mente, M. (2018). Marketing video-enabled social media as part of your e-recruitment strategy: stop trying to be trendy. *Jornal of Retailing and Consumer Services* 44, pp. 266–273.
- Waldrop, W.M. (1992). *Complexity: the emerging science at the edge of order and chaos*. New York: Touchstone.
- Yu, D. and Hang, C.C. (2010). A reflective review of disruptive innovation theory. *International Journal of Management Reviews* 12(4), pp. 435–452. doi: 10.1111/j.1468-2370.2009.00272.x.