

The Role of Temporal Norms and Orientations in Operations Management

James Aitken (james.aitken@surrey.ac.uk)
University of Surrey, U.K.

Eric Deakins
University of Waikato, N.Z.

Heather Skipworth
Cranfield University, U.K.

Rosanna Cole
University of Surrey, U.K.

Abstract

Although time features prominently in many operations management concepts it is usually presented as a boundary condition to a discussion on efficiency, planning, and control. In western societies, time is mainly viewed objectively and is assumed to be homogeneous, reified, discrete, and subject to precise measurement. Other researchers counter this perspective and support a view in which temporal norms may develop that are inconsistent with the objective notion. Through an exploratory research design, the temporal norms of two manufacturing organizations are investigated. This provides an insight into how differences in temporal orientation leads to different behaviours that impact operational performance.

Keywords: Temporal norms, temporal dimension scales, operations management

Introduction

Time is a fundamental concept within the practical application and theoretical development of operations management. Uniformity of temporal norms has formed a basis for monitoring and controlling the conversion processes which deliver customer value. Scholars have challenged this singular understanding of time through recognizing that time is a “lived experience” as well as a socially constructed measure which is independent of the observer (Klassen and Hajmohammad, 2017; Reinecke and Ansari, 2015). This research examines the influence and role of temporal norms on the management of operations.

Temporal norms are considered a process of normative regulation through which situations and dispositions interact to determine organizational and individual-level norms about time (Jackson, 1996). Western temporal norms are represented by linear clock-time which characterizes time as being a resource which be used to synchronise

tasks, increase efficiency and standardise business processes in which people operate. The hegemony of clock-time has been challenged by other researchers who highlight that different time perspectives held by individuals can impact the performance of a group and the processes in which they operate (Bluedorn, 2002). Management scholars have begun to develop an understanding of the challenges in managing temporal perspectives complexity in organizations, however the influence of different temporal norms in operations management is an area that has had little research focus (Halbesleben et al., 2003). Researchers in psychology have developed and tested instruments to measure and assess different temporal dimensions within organizations (Schriber and Gutek, 1987; Janicik and Bartell, 2003). This research applies this methodological approach to investigate the impact and influence of different temporal norms on the management of two manufacturing organizations.

This research aims to enhance our understanding of behavioral operations management through two major contributions. Firstly, our paper provides evidence about how different temporal norms lead to different organizational behaviors. Secondly, the paper considers how managers may apply these findings to improve the alignment of individuals with the temporal objectives of the organization.

Literature Review

Time Perspectives and Norms

Although time features prominently in many operations concepts including lead time, time compression, and JIT it usually presents as a backdrop to a research discussion on efficiency, planning, and control (Klassen and Hajmohammad, 2017). Time in management research is often conceptualized as a boundary condition or the causal ordering of variables that place limitations on propositions derived from a theoretical model (Mitchell and James, 2001). Researchers beyond the field of operations management however, have developed time as a research lens to provide a much richer understanding of strategic change (Kunisch et al., 2017), leadership (Chen and Nadkarni, 2017), organizational change (Turner and Rindova, 2017), marketing (Harvey et al., 2008) and sustainability (Slawinski and Bansal, 2012). Utilizing a temporal lens could enrich our comprehension of operations in important ways. For example, new mechanisms could be developed providing insights into issues such as why two similar sized businesses operating in the same sector have different delivery performances.

In western societies, time is mainly viewed objectively and is assumed to be homogeneous, linear, unitary, reified, discrete, and subject to precise measurement (Mosakowski and Earley, 2000). Separating the present time from the past and future, presents phenomena as isolable occasions independent from previous events (Reinecke and Ansari, 2015). The structuring and commoditization of time that developed from this perspective is encapsulated in phrases such as “time is money”, “time is our most valuable commodity” and “time is of the essence”. Time, as a scarce resource (though it is inexhaustible) is closely related to organizational productivity providing an organizational focus on managing its use in order to deliver business objectives. Building upon operations management Taylorism foundations, this perspective implies an ability to organise, regulate, synchronise and control time in pursuit of operations management objectives, as work is designed to “fit group-member temporal orientations and provide flow” (Ancona et al., 2001: 645). Focus on temporal events such as month and year end, material requirement planning schedules and prescribed delivery windows, future outcomes can be predicted and controlled, supply chain activities synchronized, and the allocation of the total amount time across multiple tasks can be achieved (Bluedorn and Denhardt, 1998; Reinecke and Ansari, 2015), providing an etic quality to time in the

pursuit of specific business objectives and managerial interventions.

Reinecke and Ansari (2015:643) argue that the clocked-time boundaries that scholars have utilized in management models “need to be readdressed to cultivate heterogeneity in organizational temporal norms”, reflecting that temporalities are malleable and can be configured to match the phenomena under investigation (Bluedorn and Waller, 2006; Klassen and Hajmohammad, 2017). Other researchers, counter the clock time temporal perspective and support a “lived time” or process view (Chen and Miller, 2011) in which temporal norms amongst organizational members may emerge that are inconsistent with the objective notion (Bluedorn and Denhardt, 1998). The process time perspective is derived from human experience based on temporal continuity of flow from the past, to the present, and future (Schriber and Gutek, 1987; Reinecke and Ansari, 2015). From a process time perspective, people view and value time differently (Levine, 1997). How time is perceived, experienced and socially organized within and across individuals and organizations is a growing research area for scholars moving beyond the unitary concept of clock-time (Schriber and Gutek, 1988; Reinecke and Ansari, 2015; Klassen and Hajmohammad, 2017). Time being viewed as both an objective measure, through a clocked-hour prism, and as a subjective experience which can drive behavior contrary to business expectations.

Regardless of which temporal perspective an organization adopts it still faces entrainment pressures from its environment (Ancona and Waller, 2007). The time norms that develop within the firm need to align with the demands of customers if it is to succeed (Schriber and Gutek, 1987). However, it is debatable whether organizations can leverage ambitemporality and create new opportunities by accommodating and adopting contradicting temporal perspectives (Reinecke and Ansari, 2015). An issue which is reflected in the tensions of exploitation, through tight time controls, and exploration, through creativity and serendipity, in operations management. Our research begins to address the role of divergent temporal perspectives and norms in manufacturing organizations to understand the assumptions which drive the management of time and how it relates to anticipated business performance

Measurement of time norms

Temporal norms reflect an organization’s culture and govern how individuals use and perceive time and work (Janicik and Bartell, 2003). Through comprehending when an activity starts and stops, and how work pace and deadlines influence behavior, it is possible to develop and understand organizations temporal norms (Blount and Janicik, 2001; Ancona et al., 2001; Bluedorn and Denhardt, 1998). Manufacturing organizations create temporal norms with production schedules to allocate time across multiple activities. Dividing time in this manner provides a temporal pattern which can be used to control the use of time and reduce uncertainty in the conversion process as well as inputs and outputs. Through the clock-time perspectives managers directly monitor the temporal dimensions of schedules and deadlines, allocations, punctuality, pace, coordination, synchronization, autonomy of time use and routine versus variety (Schriber and Gutek, 1987). Less obvious for organizations are process time temporal dimensions related to awareness of time use by individuals, trade-offs between speed and quality as well as temporal continuity of the past, present and future (Bettenhausen & Murnighan, 1985; Janicik and Bartell, 2003). Each of these dimensions will now be discussed in more detail as they form the basis for the instrument developed by Scriber and Gutek (1987) to assess an organizations temporal norm;

Schedules: scheduling can be represented by list of times that activities should actioned by.

How these are portioned, scheduled and executed can have a significant influence on the organization and its people (Scriber and Gutek, 1987).

Deadlines: provide milestones for the start and stop of activities which can be set externally by customers or internally through synchronized tasks (McGrath and Rotchford, 1983).

Punctuality; is an important temporal norm that requires individuals or group to complete an obligation by a previously agreed time (Janicik and Bartell, 2003).

Future Orientation and Quality versus Speed; is the temporal orientation of the organization's members derived from human experience based on temporal continuity of flow from the past, to the present, and future (Reinecke and Ansari, 2015).

Allocation of Time: is the quantity of time that is prescribed to a task.

Sequencing: Is the "sequence which requires an activity to follow another in a prescribed order" (Moore, 1963:8).

Awareness of Time Use: this dimension reflects an individual's recognition of the importance of time and how they use the time available to them (Janicik and Bartell, 2003).

Work Pace: is the rate set for the completion of an activity requiring minimal temporal variability and is directly related to productivity (Bosch et al., 2011).

Autonomy of Use of Time: this dimension reflects the degree of freedom an individual has in determining the schedule for completion of an activity (Scriber and Gutek, 1987).

Synchronization and Coordination: Within manufacturing this can be portrayed by a cell layout which requires entrainment as one part of the process becomes "captured by, and set to oscillate in rhythm with, another process" (Bluedorn and Denhardt, 1998:313) whilst, managing the performance of each stage of the sequenced process.

Routinization versus Variety: activities which are cyclic can become routinized over a period of time while those which occur rarely or infrequently reflect variety in a process.

Intra-organizational Time Boundaries: this dimension reflects the temporal norms which develop within a department and can differ from other parts of an organization (Janicik and Bartell, 2003).

Despite being developed within the psychology field the instrument developed by Scriber and Gutek (1987) that will be used in this research, closely aligns with the five OM objectives of cost/efficiency, speed/time, dependability, flexibility and quality by Slack et al. (2010) and the related perspectives on time.

Methodology

An exploratory research design was adopted to investigate the temporal norms of two manufacturing organizations. The constructs defined in the literature review were assessed using Scriber and Gutek's (1987) survey instrument. The scales developed were shown to be reliable with Cronbach's alphas ranging from 0.80 for schedules and Deadlines to 0.52 for variety vs routine. Interviews provided further insights into the responses and were used to assess the instrument's ability to reflect participant meaning. In comparing the responses, the researchers aimed to find the patterns of temporal norms that distinguishes each organization.

Company A is a specialist restorer and repairer of vintage cars. The work content of each customer’s vehicle is often unknown until it arrives on-site for inspection. The company is faced with increased levels of schedule instability and a supply chain that is populated with unreliable suppliers. Company A has 19 employees in total, of which 3 managers and 9 staff (63% of population) returned usable survey responses.

Company B is an assembler of electrical products employing over 150 people. Products are sold on a B2B basis within the UK and internationally. Product range is based on a modular design with customization taking place for installation purposes. Company B is an organization which has a very structured planning process that is supported by ERP. It can be classed as a firm with higher volumes than company A, and lower variety. Operators/engineers are expected to perform regular scheduled tasks. Company B has 98 employees in total, of which 10 managers and 39 staff (50% of population) returned usable survey responses

Findings

Temporal norms comparisons were made both within companies and between companies, and the unit of analysis adjusted accordingly. The essential method of statistical analysis was ANOVA, which was used to detect whether the differences observed between the groups were due to chance. All of the within-company comparisons of *overall* time perceptions of the temporal norms (comparing manager and staff perceptions inside the same company) revealed no significant differences (see fig.1).

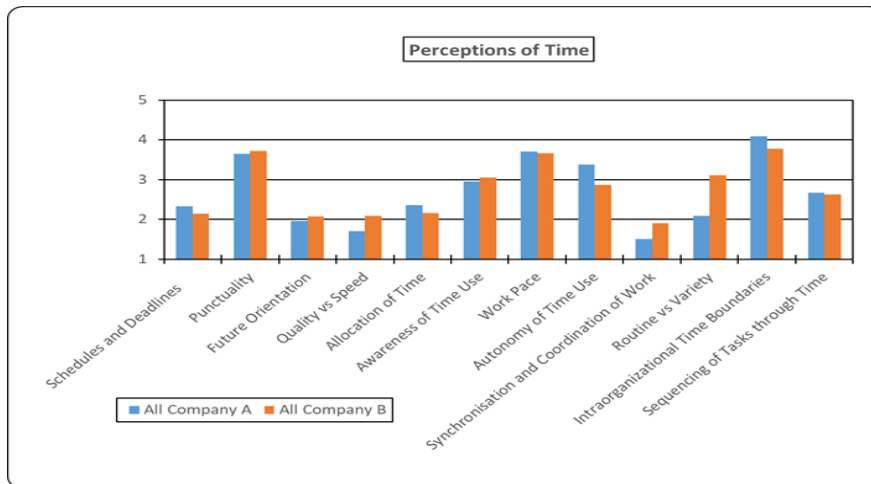


Figure 1 - Overall Perceptions of Time - comparison between All Employees (Co. A vs Co. B)

However, examination of the within-company comparisons of *individual* time norms dimensions (comparing manager and staff perceptions inside the same company) revealed a different story: -

In Company A, a statistically significant difference between the two populations (management and staff) for the individual time dimensions (see Fig.2), was detected for the following;

- Schedules and Deadlines (significant at the $p < .05$ level)
- Quality vs Speed (significant at the $p < .05$ level)
- Awareness of Time Use (significant at the $p < .05$ level)
- Work Pace (significant at the $p < .10$ level)

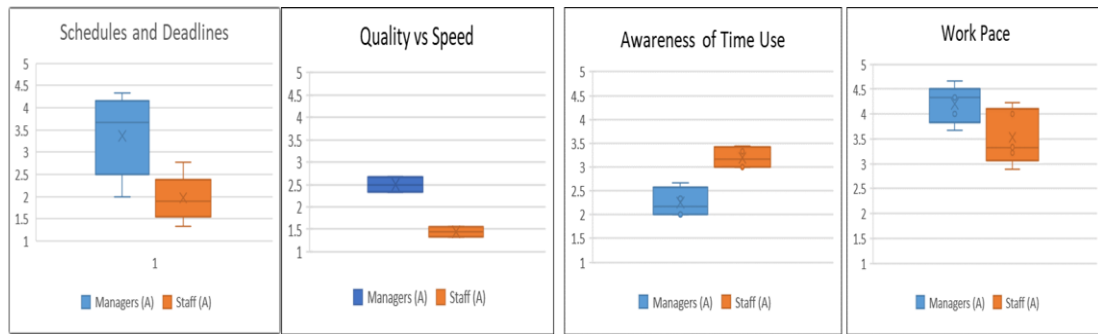


Figure 2 - Company A manager and staff perceptions differences

In Company B, no significant differences were detected between the time perceptions of Managers and Staff in Company B regarding any of the individual time dimensions.

Similar to the within-company comparisons, all of the between-company comparisons of *overall* time perceptions (comparing the perceptions of all employees/managers/staff respectively across different companies) revealed no significant differences. However, examination of the individual time dimension perceptions (comparing the perceptions of all employees/managers/staff respectively across different companies) revealed mixed findings. While there was no statistically significant difference detected between all employees (staff and managers) in Company A and all employees in Company B, regarding their overall perceptions of time, a statistically significant difference was detected between these two populations for a single time dimension: routine vs variety (see Fig. 3)

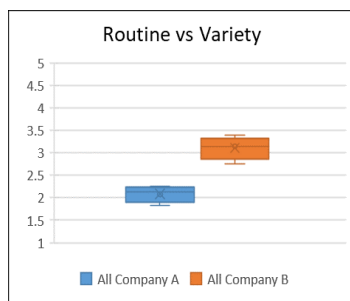


Figure 3: Difference in perceptions between all employees (company A vs B) routine vs variety (significant at the $p < .05$ level)

While there was no statistically significant difference detected between the managers in Company A and the managers in Company B, regarding their *overall* perceptions of time norms, a statistically significant difference was detected between these two populations for *individual* time dimensions (see Fig. 4):

- Routine vs Variety (significant at the $p < .05$ level)
- Awareness of Time Use (significant at the $p < .1$ level)

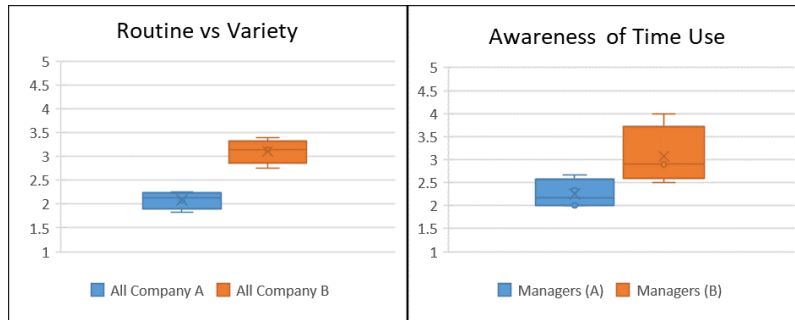


Figure 4: Differences in managers perspective (Company A vs B) of routine vs variety & Awareness of time use

Similarly, while there was no statistically significant difference detected between the staff in Company A and the staff in Company B, regarding their *overall* perceptions of time norms, a statistically significant difference was detected between these two populations for *individual* time norm dimensions (see Fig. 5):

- Quality vs Speed (significant at the $p < .1$ level)
- Routine vs Variety (significant at the $p < .05$ level)



Figure 5: Differences in staff perspectives (company A vs B) of the time norms of quality vs speed & routine vs variety

Finally, the survey and interview findings for company A highlighted differences between members of the same organization in their individual perspectives of time beyond the manager versus staff categorization. Compared to supervisors and managers, in company A, production staff exhibited significant variation in perspective across several dimensions. This nonalignment reflected issues with productivity and schedule adherence that were also noted within the organization, raising the hypothesis that emergent time norms exert more control in manufacturing than scheduled time norms.

Discussion

The findings supported an internal process view (Chen and Miller, 2011) whereby temporal norms of individuals are not consistent with the objective notion of clock-time (Bluedorn and Denhardt, 1998). For example, emergent time norm dimensions are found to be more important in the case study A, evidenced by awareness of time use and quality vs speed dimensions, than the ERP driven time structured approach of company B. These differences support the process time perspective being derived from human experience based on temporal continuity of flow from the past, to the present, and future (Schriber and Gutek, 1987; Reinecke and Ansari, 2015). In particular, from a process time

perspective, people view and value time differently (Levine, 1997) as Company A value the quality of their goods over any delivery lag involved with getting it 'right'. This supports Dougherty et al.'s (2013) findings in product development whereby temporal conflict between researchers, focused on learning, and managers, driven by clock-time perspectives, were found. Reflecting a shift from controllable environs of clock-time to elusive non-linear endogenous processes in which managers struggle to manipulate the temporal rhythm is key here (Reinecke and Ansari, 2015). Therefore, time being viewed ambitemporality, as both an objective measure of clock-time, and as a subjective experience which can drive behavior contrary to business expectations, has been found. For example, in Company A, quality and speed show differences for managers and staff - only staff believe that doing things right is better than doing things fast, compared to managers which starts to show the different objectives the two groups have in the workplace. This is because for Company A, and in particular with the manufacturing of very specific and detailed parts, it is the staff who will have to deal with quality issues and their consequences.

The entrainment pressures from the organizations' environment are linked to which temporal norms the business adopts (Ancona and Waller, 2007). Similar to the study by Schriber and Gutek (1987), our findings in a manufacturing context show that the time norms that develop within the firm need to align with the demands of customers if it is to succeed. For example, customers of Company A require a bespoke, prestige product where quality is more important than speed. Company B is trading with large organizations (such as regional councils) who need products, at a competitive price and quality, to be on-site at a specific time. The similarities between the firms relate to predominance of clock-time perspective in Western manufacturing firms, while the differences reflect the subjective experience of Company A where quality, for customers and employees, outweighs the need to deliver quickly.

Thus, our findings show that organizations develop different temporal norms depending upon the industry sector and priorities they are addressing (Doob, 1971). The routinization of tasks in company B reflect the highly structured operation with standard operating procedure being readily available. With company A the variety of customized/bespoke products limit the establishment of repeatable task codification. The relatively unstructured nature of activities in company A, the car restoration firm, is reflected in the different time norms of the management teams, where staff are expected to have a degree of freedom on how they use time as unexpected issues arise during the restoration process. Whereas company B operate a production line where the use of time is "controlled" by programmed machinery.

The results for Company A and B show that temporal norms represent the shared experiences of people and the way they work in terms of the quality and speed trade off, routinization of tasks and schedule flexibility (Ancona et al, 2001; Janicik and Bartel, 2003). Normative regulations of organizational time norms are developed (Jackson, 1996) but the individual level is more complex. From a practical perspective, a behavioral framework to facilitate and support people in altering and (re)aligning their time norms is required to achieve enhanced business and personal performance.

Our research has found this instrument to be relevant in the operations management context. It also provided several insights into the views and assumptions held by workers that aid our understanding of how differences in temporal attitude lead to behaviors that impact operational performance. A temporal lens offers a new class of variables with which to examine a wide range of operational challenges, such as adherence to schedules. Adopting a temporal lens may also prompt operations managers to develop a different language with which to address the ever-increasing challenge of delivering better quality

and performance in less time and may lead organizations to question norms around speed versus quality and variety versus routine.

Conclusion

Beyond the unitary concept of clock-time, this study has investigated how time is perceived, experienced and socially organized within and across individuals and organizations; a call made by Reinecke and Ansari (2015) and Klassen and Hajmohammad (2017). Time is a subjective experience which drives behavior contrary to traditional business expectations which often use objective measures of time. By adopting a temporal lens framework to view organizational phenomena, researchers in operations management are forced to ask different questions as time moves from a boundary condition to a more important role in explaining the what, why and how of operations concepts. Our study has considered the process time temporal dimensions related to awareness of time use by individuals and speed vs quality which show significant differences to overall perceptions of time norms based on a clock-time perspective. Differences which have practical implications for managers in terms of delivering business objectives and priorities.

Limitations and Future Research

The adopted time norms instrument is based on Western culture and perspectives of time. Our findings have confirmed the applicability of the tool developed in the USA within the UK. However, it remains untested in a non-Western environment. Different cultures may prefer and understand different time dimensions beyond our findings. The study provides a snapshot of time, through the application of a questionnaire and so is limited in understanding how time norms change over time, necessitating a longitudinal study. Further research questions may consider whether different temporal norms are reflected in different supply chain management practices; whether temporal norms change state over time, and if so, whether it alters in an incremental or discontinuous fashion.

References

- Ancona, D., Goodman, P., Lawrence, B. & Tushman, M. (2001), "Time: A New Research Lens", *The Academy of Management Review*, Vol. 26, No. 4, pp. 645-663.
- Ancona, D., & Waller, M. J. (2007), "The dance of entrainment: Temporally navigating across multiple paces", *Research in the Sociology of Work*, Vol. 17, pp. 115-146.
- Bettenhausen, K., & Murnighan, J. K. (1985), "The emergence of norms in competitive groups", *Administrative Science Quarterly*, Vol. 30, pp. 350-372.
- Blount, S., & Janicik, G. A. (2001), "When plans change: Examining how people evaluate timing changes in work organizations", *Academy of Management Review*, Vol. 26, pp. 566-585.
- Bluedorn, A.C., (2002), *The human organization of time: Temporal realities and experience*, Stanford University Press.
- Bluedorn, A. & Denhardt, R. (1998), "Time and Organizations", *Journal of Management*, Vol. 14, No. 2, pp. 299-320.
- Bluedorn, A. C., & Waller, M. J. (2006), "The stewardship of the temporal commons", *Research in Organizational Behavior*, Vol. 27, pp 355-396.
- Bosch, T, Mathiassen, S., Visser, B., de Looze, M. & van Dieën, J. (2011), "The effect of work pace on workload, motor variability and fatigue during simulated light assembly work", *Ergonomics*, Vol. 54, No. 2, pp. 154-168.
- Chen, M. J. & Miller, D. (2011), "The relational perspective as a business mindset: managerial implications for east and west", *Academy of Management Perspectives*, Vol. 25 No. 3, pp. 6-18.
- Chen, J. and Nadkarni, S., (2017), "It's about time! CEOs' temporal dispositions, temporal leadership, and corporate entrepreneurship", *Administrative Science Quarterly*, Vol. 62, No. 1, pp. 31-66.
- Dougherty, D., Bertels, H., Chung, K., Dunne, D. D., & Kraemer, J. (2013), "Whose Time Is It? Understanding Clock-time Pacing and Event-time Pacing in Complex Innovations", *Management and Organization Review*, Vol. 9, No. 2, pp. 233-263.

- Doob, L. W. (1971). *Patterning of time*. New Haven, CT: Yale University Press.
- Halbesleben, J.R., Novicevic, M.M., Harvey, M.G. & Buckley, M.R. (2003), "Awareness of temporal complexity in leadership of creativity and innovation: A competency-based model", *The Leadership Quarterly*, Vol. 14, No. 4-5, pp. 433-454.
- Harvey, M.G., Kiessling, T.S. & Glenn Richey, R., (2008), "Global social time perspectives in marketing: a strategic reference point theory application", *International Marketing Review*, Vol. 25, No. 2, pp.146-165.
- Jackson, J. (1966). A conceptual and measurement model for norms and roles. *Pacific Sociological Review*, Vol. 9, No. 1, pp. 35-47.
- Janicik, G. A., & Bartel, C. A. (2003), "Talking about time: Effects of temporal planning and time awareness norms on group coordination and performance". *Group Dynamics: Theory, Research, and Practice*, Vol. 7, No. 2, pp. 122.
- Klassen, R. & Hajmohammad, S. (2017), "Multiple temporal perspectives extend sustainable competitiveness", *International Journal of Operations and Production Management*, Vol. 37 No. 11, pp. 1600-1624.
- Kunisch, S., Bartunek, J., Mueller, J. & Huy, Q. (2017), "Time in strategic change research", *Academy of Management Annals*, Vol. 11, No. 2, pp. 1005-1064.
- Lee, H. (2004), "The Triple-A Supply Chain", *Harvard Business Review*, Vol. 82, No. 10, pp. 102-113.
- Levine, R. (1997). A geography of time: The temporal misadventures of a social psychologist. *A geography of time*.
- Lewin, K. (1951), *Field theory in the social sciences: Selected theoretical papers*, Harper, New York
- McGrath, J. E., & Rotchford, N. L. (1983), "Time and behavior in organizations" In B. Straw and L. Cummings (Eds.), *Research in organizational behavior* (Vol. 5, pp. 57-101). Greenwich. CT JAI Press.
- Mitchell, T.R. & James, L.R. (2001), "Building better theory: Time and the specification of when things happen", *Academy of Management Review*, Vol. 26, No. 4, pp. 530-547.
- Moore, W. E. (1963). *Man, time, and society*. New York: Wiley.
- Mosakowski, E. & Earley, C. (2000), "A selective review of time assumptions in strategy research", *The Academy of Management Review*, Vol. 25, No. 4, pp. 796-812.
- Reinecke, J. & Ansari, S. (2015), "When times collide: Temporal brokerage at the intersection of markets and developments," *Academy of Management Journal*, Vol. 58, No. 2, p. 618.
- Rother, M. (1999) "Learning to see: Value stream mapping to add value and eliminate Muda", Lean Enterprise Institute.
- Schriber, J. & Gutek, B. (1987), "Some time dimensions of work: Measurement of an underlying aspect of organization culture", *Journal of Applied Psychology*, Vol. 72, No. 4, pp. 642-650.
- Slack, N., Chambers, S., & Johnston, R. (2010), *Operations Management*, Pearson Education Limited, England.
- Slawinski, N., & Bansal, P. (2012), "A matter of time: The temporal perspectives of organizational responses to climate change", *Organization Studies*, Vol. 33, pp. 1537– 1563.
- Smith, A. (1776), "An inquiry into the nature and causes of the wealth of nations".
- Turner, S.F. & Rindova, V. (2017), Watching the clock: Action timing, patterning, and routine performance. *Academy of Management Journal*.