

**Visual Performance Management: Does it Work
in Public Service Organisations?**

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ABSTRACT: *Visual Performance Management (VPM) has been prominent within Lean manufacturing environments for a number of decades, but its use has only recently started to emerge in service organisations. We consider the transition of VPM approaches to service environments and, utilising a case study method with two public service organisations, we explore four aspects of visual performance implementation. We start by exploring the strategic drivers for VPM adoption, the transparency of VPM, the performance management approach used, and changes in organisational effectiveness resulting from the introduction of VPM. Findings indicate that VPM approaches do work within public service environments, and have a tangible impact on management, but strategic alignment and data integrity are common concerns, and should be considered essential prerequisites.*

Keywords: visual performance, organisational performance, service operations, performance measurement, process improvement

This paper focuses on the use of visual performance management (VPM) approaches within service operations. The use of VPM in services has gained popularity in recent years, spreading from a manufacturing base to wider operational and strategic application in service industries, such as healthcare and public sector organizations. This paper evaluates the current literature on VPM, and considers if its transition from a largely manufacturing approach has been successful and appropriate for service industries. We use two case examples to consider its applicability within a service context, and compare their use of VPM as a performance improvement approach. In the context of this paper, we broadly define visual performance management as the communication of organisational performance information through visual media, such as dashboards or display boards. The use of VPM as a method of reviewing and communicating performance against key metrics has become more widespread with the acceptance that performance is not just about reporting financial results, but may also include appropriate non-financial performance of key organisational metrics—VPM is often an excellent way to achieve this communication. We now briefly explore the literature, before providing a summary of both case examples, and presenting the cross case discussion.

LITERATURE REVIEW

The first use of visual management approaches were initially found in production environments (Grief, 1991), and have been attributed to the popularisation of the Toyota Production System (Hiroyuki, 1995; Ohno, 1988; Rother, 2011). Early examples of visual management were primarily used to support production operators in differentiating between the required or expected standard of production, and defective items. The further use of visual improvement approaches such as A3 reporting (Rother, 2011) and 5S (Hiroyuki, 1995) were extensions of the production operator support techniques. Jaca et al. (2014) discuss the wide array of visual production management tools and techniques, which can include layout diagrams, story boards and SPC charts; workplace physical controls such as 5S equipment locations, Kanban and identification of work areas; and even workplace condition monitors such as Andon lights and Poke-Yoke devices (Jaca et al., 2014). Visual management techniques such as statistical process control charts allow production workers to rapidly assess the condition of the production process and its output, and where necessary take action to rectify a problem situation.

Recent literature on visual management has expanded considerably and covers several areas, including (1) the strategic drivers for VPM implementation (Whittington, 1996; Kaplan & Norton, 1996; Mills, Neely, Platts and Gregory, 1998; Burgi & Roos, 2003; Eppler & Platts, 2009), (2) organisational performance management (Grief, 1991; Liff & Posey, 2004; Bititci et al., 2015), and (3) organisational effectiveness through process improvement (Kobayashi, 1990; Hiroyuki, 1995; Few, 2006; Rother, 2011; Jaca et al., 2014). It is noteworthy that virtually all of this material is focused on VPM within production environments.

Visual management in service environments

Although VPM has also been successfully applied to non-manufacturing environments, such as healthcare (Fillingham, 2007; Radnor et al., 2012) and service organisations (Allway & Corbett, 2002; Abdi et al., 2006), there is a great deal less scholarly literature specifically focused on the use of VPM within service environments. This might stem from the greater intangibility of service

operations, or reflect that VPM has developed in manufacturing and production environments in which the methods and approaches do not translate effectively to a service environment.

One of the few studies which considers the use of visual management within a service organisation, albeit still in the context of a lean implementation, is Radnor (2010) which evaluates the adoption of lean tools in a UK government department. In this context Radnor reports visual management was one of the few lean tools found to be useful and was retained after the study was concluded—visual management was used “to measure and monitor the impact of [service] processes and their improvement” Radnor (2010, p. 424). Cudney and Elrod (2011) use a survey to compare lean concepts across manufacturing and service industries and report several differences between the manufacturing and service responses. Cudney and Elrod report production organisations had nearly twice the success rate (81%) of implementing 5S and Visual Factory concepts when compared to service organisations (42%). From this we also surmise that VPM implementation is potentially more difficult and complex within a service operations environment.

Visual Performance Management Approaches

Liff and Posey (2004) define visual management as a ‘system for organizational improvement ... [that] focuses attention on what is important to improve performance across the board’ (Liff & Posey, 2004, p. 4). This definition should be as appropriate for service organisations as it is for production organisations, however, within the literature visual management is inextricably linked to Lean Thinking—this may explain to a large extent the apparent lack of application in service type environments. Smith (2013) outlines three generic applications of VPM dashboards; strategic, analytical, and operational. Of these three approaches the strategic application, providing a high level overview of the entire business performance, appears to be the most common format (Few, 2006). Strategic dashboards tend to be used by senior management, and will normally be updated in line with the business cycle of the organisation to indicate the achievement of monthly or quarterly business goals. Analytical dashboard applications are generally used to make sense of business intelligence data, and will be used by data analysts, policy makers and technical experts. Whilst the strategic dashboard provides a static overview, the analytical dashboard will usually be highly interactive, and

will allow detailed integration of the data to provide many different interpretations. Analytical dashboards will be updated as and when new information is available, or on an as required basis.

Operational dashboard applications are used to monitor the detailed short-term condition of critical business processes—those that are essential to the organisation's value chain and ultimately its long term success. Typical applications may include monitoring operational safety or quality, but could focus on anything the organisation believes is operationally important. The primary function of such applications is to highlight process abnormalities, and so these dashboards tend to operate very close to real-time with refresh rates typically less than a minute. Clearly then, the intended level of use of VPM within the organisation has major effect on the nature and content, and can therefore be considered context dependant.

The rationale for gaining empirical evidence of visual performance management is that many organisations tend to operate in functional silos and this prevents gaining a holistic view of organisational performance (Marr and Schiuma, 2003). VPM can therefore provide enhanced transparency of performance across the whole organisation, providing examples of both high and low performing areas of a single business (Marr and Schiuma, 2003). In recent years public service organisations have faced funding constraints and demands for improvement on ever tightening budgets. The performance measurement culture in public service began over 20 years ago (Hood, 1991, 1995), and since this time public service organisations have been under ever increasing pressure to demonstrate improved performance and increasing value for (tax payer) money. Over this time attempts to implement public services performance systems were perceived as adding little value and little more than a 'box-ticking exercise' which was also susceptible to gaming (Radnor and McGuire, 2004). To summarize, the literature therefore suggests that unlike some of the lean tools, visual performance management does have a place in service organisations primarily as a monitoring and measurement approach (Radnor, 2010), but its implementation is more complex (Cudney & Elrod, 2011) and is context dependant (Smith, 2013).

From the literature three potential research questions emerge as important in understanding the use of VPM within services: (1) what are the strategic drivers for VPM implementation? (2) Does VPM provide transparency across the organisation? And (3) how do service organisations actually use

VPM? Finally, a fourth research question considers: (4) does VPM provide any tangible improvement in organisational effectiveness?

RESEARCH METHOD

In order to further explore the use of visual performance management in service environments, two independent case studies (Yin, 2003b) which examined the use and benefits of visual performance management in two case study service organisations was undertaken. This multiple case study approach was chosen for primary data collection because it is considered suitable for theory building and is empirically valid (Eisenhardt, 1989; Yin, 2003a, 2003b). A mixed method approach was adopted using two sources of data from each case organisation: (1) policy and performance documents were obtained from each case organisation, and (2) semi-structured interviews with managers from each organisation. In total eight semi-structured interviews were carried out with senior managers across both case organisations. Interviewees included fire service regional and area managers, three performance managers, one housing associations CEO and one financial director. All interviews had some form of executive responsibility for their organisational performance, and were involved in the establishment of the VPM approach within their organisation. These data sources facilitated triangulation (Easterby-Smith et al., 1994; Denzin and Lincoln, 2000) which aims to guarantee validity and reliability. Adopting multiple data sources offers the opportunity to provide a higher degree of authenticity and minimise epistemological errors (Stake, 1995).

Case organisations and data collection

We have used two independent case studies (Yin, 2003b), both public sector service organisations. The first case is the New Zealand Fire Service (NZFS). The NZFS has over 1700 career and 11800 urban and rural volunteer firefighters, and operates 79 career stations and 547 urban and rural volunteer stations across the whole of New Zealand. The NZFS have a formal strategy; 'Vision 2020 – Leading Integrated Fire and Emergency Services for a Safer New Zealand'.

The second case organisation, Bournemouth Churches Housing Association (BCHA), is a registered charity which provides housing, social support and learning skills for vulnerable members of society in the South and South West of England. It employs over 400 staff, turns over in excess of

£16 million per year. BCHA has a formalised business strategy, a balanced scorecard and employ an adapted Business Excellence Model referred to as the “Investors in Excellence Award”. As a result of its diverse business operations, BCHA is heavily regulated by a number of regulatory bodies including The Housing Communities Agency (HCA) and The Adult Learning Inspectorate. Both organisations use a form of visual performance management approach to record and communicate organisational performance internally and to external stakeholders.

A structured set of interview questions were used in both cases. All interviews were recorded and transcribed, and the final transcript was sent back to the interviewee to verify. Data collection in both case organisations was through document analysis of meeting minutes and performance documentation from the PIC boards and BSC information.

CROSS CASE ANALYSIS AND DISCUSSION

We now consider how visual management has been adopted within the two service case examples (see table 1): the New Zealand Fire Service, and the Bournemouth Churches Housing Association. Both organisations are under scrutiny to provide a value based service with public money—we term this ‘strategic drivers’. Both have employed VPM to provide better communication and transparency of performance across the organisation—we term this ‘transparency’. Within the cross-case analysis we also utilise four emerging themes from the visual management literature: (1) the strategic drivers of VPM, (2) the importance of transparency, (3) visual management approach used, and (4) any resulting organisational effectiveness for implementing VPM.

Insert Table 1 about here

Strategic Drivers

Strategic drivers explore the motivation and rationale for introducing a visual performance management approach. In both case examples, there was a need to present performance data in a clear and straightforward way. Both organisations were required to provide performance information to both external stakeholders and internal staff and customers, and both had explicit strategies which they were required to report on. The NZFS (case 1) established a common process based approach to visual management across all career and volunteer fire stations. National targets for community risk

reduction, emergency response and planned business services are presented in the form of a visual management Performance Information Centre (PIC) board.

Yes, it was the stated aim of the National Commander to have one of those boards in every fire station. Each [PIC] board features a report, so for my area you have information as a whole and then you have each brigade's contribution to their target. (NZFS Area Manager)

NZFS performance is managed through a series of weekly (tactical), monthly and quarterly meetings, using a business plan approach. Business plans are produced at the region, area and station levels, and are an interpretation of the commission's national targets but reflect the circumstances and environment of in the specific location. For instance, station business plans reflect the demographics of its callout district, such as urban or rural hazards and risks, population demographics such as the number of students or elderly, and social demographics such as low income or student housing. These factors influence the specific balance of community risk reduction and therefore influence the nature of likely callouts, and consequent performance:

At a region level we monitor our performance against the commission's goals ... through the business plan that reflects those goals at a regional and area levels. In the quarterly review the area managers all report on each of the commission goals. (NZFS Region Manager)

BCHA (case 2) used visual performance as part of their overarching business strategy by purchasing and customising a proprietary balanced scorecard (BSC) software tailored to their industry and the scale of the organisation. Their motivation for selecting the BSC was to ensure that they focused their effort on the critical success factors of their business

To have an integrated system, we were focused on detail rather than business critical stuff. Another reason (is that) we have not been good at target setting and we lacked consistency. Hopefully the balanced scorecard will address this. (BCHA Quality Manager)

Public service organizations in the civil society or third sector do not technically make a profit but generate a surplus which is reinvested back into the organisation. In a climate of government funding cuts and renewable contracts open for competitive tendering, this type of public service organization needs to remain solvent by doing more for less. The need for increased business focus was prominent in both case organisations.

Social Business - Well we need to make a profit, you know, or a surplus, we call it in the third sector. Same difference. Because we need to be reinvesting that money; and also, if we don't make a profit, we go out of business, 'cos there's no one there waiting to give us loads of money, you know. (BCHA CEO)

Transparency

We define transparency in two ways. First, the integrity or fidelity of the input data is important for any performance system, and second, visibility of the performance system across a large and geographically distributed organisation is also important—it allows remote staff to see the performance of other units, and to know that performance standards and expectations are being maintained across the whole organisation. Both case examples identified transparency as a critical aspect of their visual performance approaches. The NZFS voiced this as a concern:

The accuracy of the data; we need to make sure that [what] people are putting in at the station level is accurate and correct. For example, you may get a whole lot of false alarms which could be by a particular fireman calibrated as a structure fire. That is probably one of the biggest concerns I have about the resulting data the analysis—because it's all based on that basic input. (NZFS Performance Manager 1)

One of the issues with the [PIC] board is that there's several ways you can enter the information, so instead of keeping it simple it's open to interpretation. (NZFS Area Manager)

Transparency, regarding performance across a large organisation is considered an important aspect of the NZFS performance management approach, but it also has a secondary organisational effect of developing a competitive factor across stations, areas and regions:

It gives [firefighters] a measure of performance and one of the really interesting things that comes out of that is a little bit of competitiveness because it brings a lot of transparency to the organisation. I think is very important—it gives them a comparative of how they're going compared to another station, another area, another region and it creates the desire within individuals to improve their performance because its visual. (NZFS Performance Manager 1)

From a managerial perspective transparency is also seen as important and reinforces the accountability for area and station performance:

So it's fed into a management process that gives even better transparency and more importantly accountability by those down the chain; at our level it's the area managers to the fire region manager, but equally the stations are responsible to the area manager for their performance, so those also have transparency. (NZFS Performance Manager 1)

Transparency and data integrity were an important rationale for visual performance. A visual image can summarise key data in an easy way which can be assimilated by the diverse multiple stakeholder community. A community which has values as the glue which binds the respective stakeholders together.

Some of the data is duplicated and the information is kept in silos. One committee chair needs to collect a series of data but does not know where to collect it. The balanced scorecard software should make that information readily available. (BCHA Performance Manager 2)

The organisation were also clear that it would not be used as a means of punishing individuals, instead it was an empowering tool and linked with the shared values of the organisation

... everybody is happy to share information and nobody has any secrets to hide. I think it will create a healthy market with respect to peers for continuous improvement. (BCHA Quality Manager)

Visual Management approach

With any performance system the alignment of operational metrics with the strategic goals is a critical feature. In case one, the NZFS PIC board consists of reported Key Performance Indicators (KPIs) of national targets which relate specifically to that fire station. The PIC boards therefore allow a specific station to understand their performance against several targets, including, (1) the national target set by the national headquarters, (2) the regional average for that measure (New Zealand is divided up into five fire regions), and (3) both the highest and lowest national station performance for that metric, shown as a performance band. PIC boards are static paper based displays, updated every calendar month to show the previous month's performance of the specific station, area or region. This alignment of national targets to region and area performance is referred to as 'line of sight' and is explained as:

So the commission goals (number of structure fires) are a number [rate] per 100.000 population. So there's a total national number, then we work out what it means [in terms of] the population of each of our areas. What that represents in terms of actual preventable structure fires—that's what I mean by 'line of sight'—so our contribution to meeting the national goal is to [achieve] that number per area. (NZFS Region Manager)

Visual performance management provides a more effective means of communicating information across multiple sites, a consideration that both case organisation have had to deal with. For instance, the NZFS have over 620 individual fire stations of varying size and capability throughout New Zealand. Visual management provides a standard process for reporting of performance across geographic and highly variable station environments. The PIC boards are presented in three categories: (1) Community risk reduction, (2) emergency response, and (3) business services.

In BCHA, the Balanced ScoreCard provides three visual measures, namely current performance, a year to date position and trend against the target.

The Balanced Scorecard will make the information central and will not be reliant upon individuals. Communicating better, greater access to help run the business. Very important because of multiple sites. (BCHA Finance Director)

BCHA accepted that visual performance alone will not lead to an improvement in performance but would be vital in identifying and making explicit opportunities for improvement.

The scorecard will no doubt result in some nasty coloured traffic lights but that will focus on areas for improvement and shared learning. (BCHA Finance Director).

According to the sector regulatory body traffic light, the HCA, scorecards were used by larger Housing Associations as a way of monitoring performance. Visual performance was beneficial in facilitating benchmarking against historical performance and also benchmarking with peer organizations within the sector based on metrics recommended by the HCA. The benchmarking exercise has an impact on the selection of KPIs that are measured.

...we carry out bench mark exercises either internally or through house mark, I upload data on a quarterly basis on an annual basis to House Mark. So really, they do influence our choice of key performance indicators in the organisation. (BCHA Performance Manager 3)

Organisational Effectiveness

Visual performance management should have a positive impact on organisational effectiveness. We therefore utilise this criteria to gauge the resulting changes from using VPM within an organisation. The NZFS were very positive regarding the impact of PIC boards on the performance of the organisation:

We shouldn't underestimate the power of the PIC boards in terms of what we're doing now in the way of the performance management. Prior to them there was nothing, so [they] actually brought us a whole new discipline regime of performance reporting that is becoming more and more sophisticated as we move forward. They were really the catalyst for much more robust visual reporting of our activities. (NZFS Region Manager)

The use of PIC boards and performance data has had an impact on the managerial functions of the NZFS, for instance:

It's made us be a lot more involved in managing. So without this stuff we'd be able to get out and do a lot more leading, but we get stuck in the nuts and bolts. Yeah, I see that as a down side, but we're working our strategies around it. And some of our strategies are delegation, so I sit down with my business support person, and we'll have a look through and then get the overview. (NZFS Area Manager)

Within social housing, the justification of adopting visual performance was tempered by the need to relate to the values of the organisation. If it were perceived to have a negative influence on the business it would no longer be used. The CEO commented.

I have an obsession with effectiveness and not efficiency and this cuts across what the government is doing. About how the system is shaped around our values rather than being obsessed with getting a green light...If it was doing damage I would change it or ditch it. We need to keep our identity and our purpose clearly in front of us. (BCHA CEO)

Visual performance was viewed as a means of helping staff to work smarter and management were determined not to be viewed as a tool to punish staff. The Housing Association was also realistic about the payback in terms of improved organisational effectiveness.

Short term, chaos, not meaning to sound too glib!, as any implementation causes problems, longer term assuming managers use the system to measure their own performance and their subordinates, it should be successful for (us). (BCHA Quality Manager)

CONCLUSION

In concluding this paper we focus on the four research questions drawn initially from the literature, and compare the findings across both case organisations. We also consider the limitations of this study and suggest areas for further work regarding visual performance in service industries.

Strategic Drivers

The Global Financial Crisis has required public services to use tax payer's money more effectively to deliver public services. As a consequence, both case organisations have been pressured to become more business focused—this has been the primary driver for the introduction of VPM in both organisations. Both organisations have aligned VPM to their respective 'business plans' to achieve this objective as VPM enables performance to be measured against the business plan.

Transparency

We considered transparency from two perspectives; the integrity of the input data and, visibility of the performance across the organisation. In both cases increased transparency was an outcome of VPM implementation, and was seen as beneficial. Marr and Schiuma, (2003), comment that performance transparency minimises the silo management, and fosters competition within the organisation—evidence of this was reported in both cases. Greater transparency also leads to sharing

of best practice and reducing duplication across the organisation, and again both cases reported evidence of this occurring (Tillema, 2010).

Visual Management

Both cases understood the need to focus on delivering the service rather than obsessing over the measurement. VPM was regarded as an efficient way to focus on the outcomes of the service delivery as opposed to a form filling and box ticking approach (Radnor and McGuire, 2004), and to communicate across different sites and to disparate stakeholders. Finally, VPM has encouraged competition and facilitated benchmarking of best practice across the organisation (Tillema, 2010)

Organisational Effectiveness

VPM is not a panacea but it can flag up where performance needs to be improved or highlight good practice. There is an understanding that VPM may uncover poor performance and this should be employed in the context of public service values. It provides detailed information to leaders to allow them to manage within a context of limited budgets.

Limitations and further research

This paper explored the use of visual performance management approaches within two service organisations through a qualitative case study methodology. Whilst the findings of this paper are largely context specific, and therefore not generalizable to the public service sector, they do indicate that VPM does have a potential value for large service organisations. Further research considering the applicability of VPM in a wider selection of service organisations would assist in developing our understanding this area of performance implementation, and serve to highlight the subtle but important differences between services and production environments, upon which so much of the current literature is based. Finally, Bititci et al (2015, p. 29) call for a greater focus on the ‘voice of the operator’ (in a production context). Whilst we have focused on the managerial implications of VPM, future work should consider the role and impact of VPM at the service delivery employee level.

Public service performance has also still to prove its value as a managerial approach (Radnor and McGuire, 2004). As public service organisations develop more sophisticated performance management approaches, and pursue increased levels of business focus, visual performance is likely to play an increasingly prominent role.

	Strategic Drivers	Transparency	Visual Management	Organisational Effectiveness
NZ Fire Service	<ul style="list-style-type: none"> • Pressure to become a more business focused organisation • Pressure to demonstrate value for money in terms of spending and performance • • Each fire station has a customised business plan and community response targets 	<ul style="list-style-type: none"> • Fully transparent from National command down to watch crews • Indicates performance of a single station against national targets for emergency and community response • Poor performance is transparent across all regions, area and stations 	<ul style="list-style-type: none"> • VPM has led to improvements in performance against national targets • Dedicated set of performance measures including: <ul style="list-style-type: none"> ○ 5 emergency response targets ○ 8 community risk targets ○ 4 business services targets • Organisational IT system data • Clearly identifies challenges 	<ul style="list-style-type: none"> • VPM changed leadership role to more of a managerial role • Poor performing areas identified • Data about operations available in almost real time • Leadership/management focused on data and operational improvement • Now much more focused on improving poor performance rather than arguing and debating the circumstances
Housing Association UK	<ul style="list-style-type: none"> • Private sector competition and the need to be more business focused • Need to make an annual surplus • Poor performers may be left behind • CI essential in climate of cuts • Competitive tendering growing • Grant award criteria needs reform • Big Society is a bit woolly • Don't wish to create a bureaucracy out of visual performance. • Cost of visual performance needs to be appropriate for their needs. • Helps to link to business plan 	<ul style="list-style-type: none"> • Need to guard against only being concerned with what is being measured. • Avoids duplication • Human Error in inputting data • Danger of gaming the metrics • Information can be readily available to all stakeholders. 	<ul style="list-style-type: none"> • Have robust reporting with KPIS • IT can enables visual Performance Management • Need to guard against obsessing with systems and not service • Non- Financial Measures can be tomorrows turnover • Visual performance has led to an improvement in performance • Level of sophistication of performance measurement depends on complexity of the business 	<ul style="list-style-type: none"> • Need dedicated person to collate data • Savings in having the information to hand but ultimately perceived to have a neutral outcome overall • Change has resulted in staff leaving • Don't believe bus focus is incompatible • Staff are going to need to behave more business like • Performance linked to reward • A tool that helps us to work smarter rather than getting colleagues into trouble

Table 1: A comparison of factors for each case organisation

REFERENCES

- Abdi, F., Shavarini, S. K., Hoseini, S., & Mohammad, S. (2006). Glean Lean: how to use lean approach in service industries? *Journal of Services Research*, 6.
- Allway, M., & Corbett, S. (2002). Shifting to lean service: Stealing a page from manufacturers' playbooks. *Journal of Organizational Excellence*, 21(2), 45-54.
- Bititci, U., Cocca, P., & Ates, A. (2015). Impact of visual performance management systems on the performance management practices of organisations. *International Journal of Production Research*, (ahead-of-print), 1-33.
- Bürgi, P., & Roos, J. (2003). Images of strategy. *European Management Journal*, 21(1), 69-78.
- Denzin, N.K. and Lincoln, Y. S. (1994). *Handbook of Qualitative Research*. Thousand Oaks, CA: Sage.
- Cudney, E., & Elrod, C. (2011). A comparative analysis of integrating lean concepts into supply chain management in manufacturing and service industries. *International Journal of Lean Six Sigma*, 2(1), 5-22.
- Easterby-Smith, M., Thorpe, R. and Lowe, A. (1994). *Management Research: An Introduction*. London: Sage.
- Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of Management Review*, Vol. 14(4): 532-550.
- Eppler, M. J., & Platts, K. W. (2009). Visual strategizing: the systematic use of visualization in the strategic-planning process. *Long Range Planning*, 42(1), 42-74.
- Few, S. (2006). *Information dashboard design*, O'Reilly.
- Grief, M. (1991). *The Visual Factory*. Portland Productivity Press.
- Hiroiyuki, H., (1995), *Five Pillars of the Visual Workplace*, New York: Productivity Press
- Hood, C. (1991). A Public Management for All Seasons? *Public Administration*, Vol. 69(1): 3-19.
- Hood, C. (1995). The 'new public management' in the 1980s: variations on a theme, *Accounting, Organisations and Society*, Vol. 20: 93-109.
- Fillingham, D. (2007). Can lean save lives? *Leadership in Health Services*, 20(4), 231-241.
- Jaca, C., Viles, E., Jurburg, D., & Tanco, M. (2014). Do companies with greater deployment of participation systems use Visual Management more extensively? An exploratory study. *International Journal of Production Research*, 52(6), 1755-1770.

- Kaplan, R. S., & Norton, D. P. (1996). *The balanced scorecard: translating strategy into action*. Harvard Business Press.
- Kobayashi, I. (1990). *20 Keys to workplace improvement*. Productivity Press.
- Liff, S., & Posey, P. A. (2004). *Seeing is believing: how the new art of visual management can boost performance throughout your organization*. AMACOM Div American Mgmt Assn.
- Marr, B. and Schiuma, G. (2003), "Business performance measurement – past, present and future", *Management Decision*, Vol. 41 No. 8, pp. 680-7.
- Miles, H. and Huberman, M. (1994). *Qualitative Data Analysis: An Expanded Sourcebook* (2nd edn). London: Sage.
- Ohno, T. (1988). *Toyota Production System: Beyond large-scale production*. Productivity press.
- Radnor, Z. J., Holweg, M., & Waring, J. (2012). Lean in healthcare: the unfilled promise?. *Social Science & Medicine*, 74(3), 364-371.
- Radnor, Z. (2010). Transferring lean into government. *Journal of Manufacturing Technology Management*, 21(3), 411-428.
- Radnor, Z. J. and McGuire, M. (2004) Performance management in the public sector: fact or fiction? *International Journal of Productivity and Performance Management*, 53(1) 245-60.
- Rother, M. (2011). *Toyota Kata: Managing people for improvement, addictiveness and superior results*. McGraw-Hill Professional.
- Smith, V. S. (2013), Data Dashboard as Evaluation and Research Communication Tool. *New Directions for Evaluation*, 140, p. 21.
- Stake, R. (1995), *The art of case research*, Sage Publications.
- Tillema, S. (2010), Public sector benchmarking and performance improvement: what is the link and can it be improved? *Public Money & Management*, 30, 1, p. 69.
- Whittington, R., (1996), Strategy as Practice, *Long Range Planning*, 29, 5, pp. 731 to 735
- Yin, R. K. (2003a). *Applications of Case Study Research* (2nd edn). Thousand Oaks: Sage.
- Yin, R. K. (2003b). *Case Study Research: Design and Methods* (3rd edn). Thousand Oaks: Sage.