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Visual Management in Brazilian Construction Companies: Taxonomy and Guidelines for Implementation

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<table>
<thead>
<tr>
<th>Case Study No</th>
<th>Purpose of VM</th>
<th>VM tools features</th>
<th>Capturing VM practices for Future Use</th>
<th>Suggestions for VM implementation</th>
<th>VM implementation issues</th>
<th>Measuring VM performance?</th>
</tr>
</thead>
</table>
| 1             | • Transparency  
• Simplification  
• Better communications between management and (poorly educated) workforce  
• Efficiency and discipline on sites  
• Positive impact on the company’s image  
• Easier site control  
• Increase productivity | Direct, simple, low-cost and colorful (attractive) | Informally, keeping VM records | • Awareness about production management and lean construction is essential  
• Concentrating not only in production | • Training workforce can be time consuming  
• Trained worker turnover  
• Some lack of consistency in using the tools  
• Some visual tools are costly | No |
| 2             | • Giving timely information  
• Raising consciousness about the construction environment  
• Demonstrating good practices  
• Enabling easier to control and more standardized construction sites  
• Reducing waste | - | Formally capturing and documenting different VM implementations (on CDs, catalogues etc). Share practices over the company intranet. | • A comprehensive training plan  
• Close supervision of new workers  
• Regularly updating and sustaining different visual tools | • Training workforce can be time consuming | No |
| 4             | • Simplification; reducing complexity on sites  
• Bonding management and workforce through visual communication  
• Giving information about the site to the (poorly educated) workforce  
• Answering workforce questions; guiding the workforce  
• Coordination of the workforce  
• Enabling interaction between the management and the workforce.  
• Enabling orderly and more standardized construction sites.  
• Contributing to the positive image of the company. | Simple, concise, direct and low-cost | Formally capturing and documenting different VM implementations (on CDs, catalogues etc) | • Understanding the concept of transparency before application  
• Top managements' support of VM  
• Patience and persistence in training  
• Close supervision of the workforce  
• Demonstrating the practical benefits of different visual tools to the workforce  
• Paying close attention to the suggestions of the workforce  
• Maintaining the key personnel  
• Standardizing the production system  
• Experimentation with different tools | • Training workforce can be time consuming  
• Trained worker turnover | |
| 5             | • Better site organization  
• Cleanness  
• Reducing waste  
• Fewer mistakes  
• Maintaining discipline on site  
• Easier, simplified and attractive communication for the workforce  
• Easier control of the site by the management  
• Stabilizing worker performance by displaying the information the worker needs.  
• Creating a better image of the company in clients’ and visitors’ perception | - | Formally capturing and documenting different VM implementations (on CDs, catalogues etc) | • Patience and persistence in training  
• Demonstrating practical benefits of different visual tools to the workforce  
• Receiving feedback from the workforce  
• Getting the foreman’s consent | • Training workforce can be time consuming  
• Resistance to change | No |
### Table 5 – Cross-Case Comparison of the Implementation Process (continued)

<table>
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<tr>
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</table>
| 6             | • A tool for people to see the if the construction site works as intended and the deviations from the expected.  
• Worker empowerment  
• Answering workforce questions; guiding the workforce  
• Creating a better image of the company in clients' and visitors' perception  
• Reducing waste | Simple concise, direct, do not need to be low-cost | Formally capturing and documenting different VM implementations (on CDs, catalogues etc) | • Provide suitable channels for the workforce to suggest new ideas and to express themselves (experimentation)  
• Top managements' support of VM  
• Importance of communicating the vision of the company  
• Training by showing  
• Understanding the theory behind VM | • Training workforce can be time consuming  
• Resistance to change at initial implementation  
• Creating the ownership of the workforce for VM | No |
| 7             | • Facilitating construction tasks for management  
• Answering workforce questions; guiding the workforce  
• Creating a better image of the company in clients' and visitors' perception | Direct, simple, low-cost and colorful (attractive) durable | Formally capturing and documenting different VM implementations (on CDs, catalogues etc.) | Training by showing (using videos) is important | Training workforce can be time consuming  
• Resistance to change at initial implementation  
• Workers may be afraid of making mistakes | No |
| 8             | • Giving timely information  
• Facilitating construction tasks for workers and site control for management  
• Increasing the types of work the workers can do on their own  
• Creating a better image of the company in clients' and visitors' perception | Direct, simple, low-cost and colorful (attractive) | Formally capturing and documenting different VM implementations (on CDs, catalogues etc.) | Comprehensive training plan  
• Persistence and regularity in training  
• Care is needed not to create visual pollution (excess information) | Training workforce can be time consuming  
• Defining responsibilities for managing different VM tools / systems | No |