

01 Introducing the Central Backup Cellular Manufacturing System (CBCMS)

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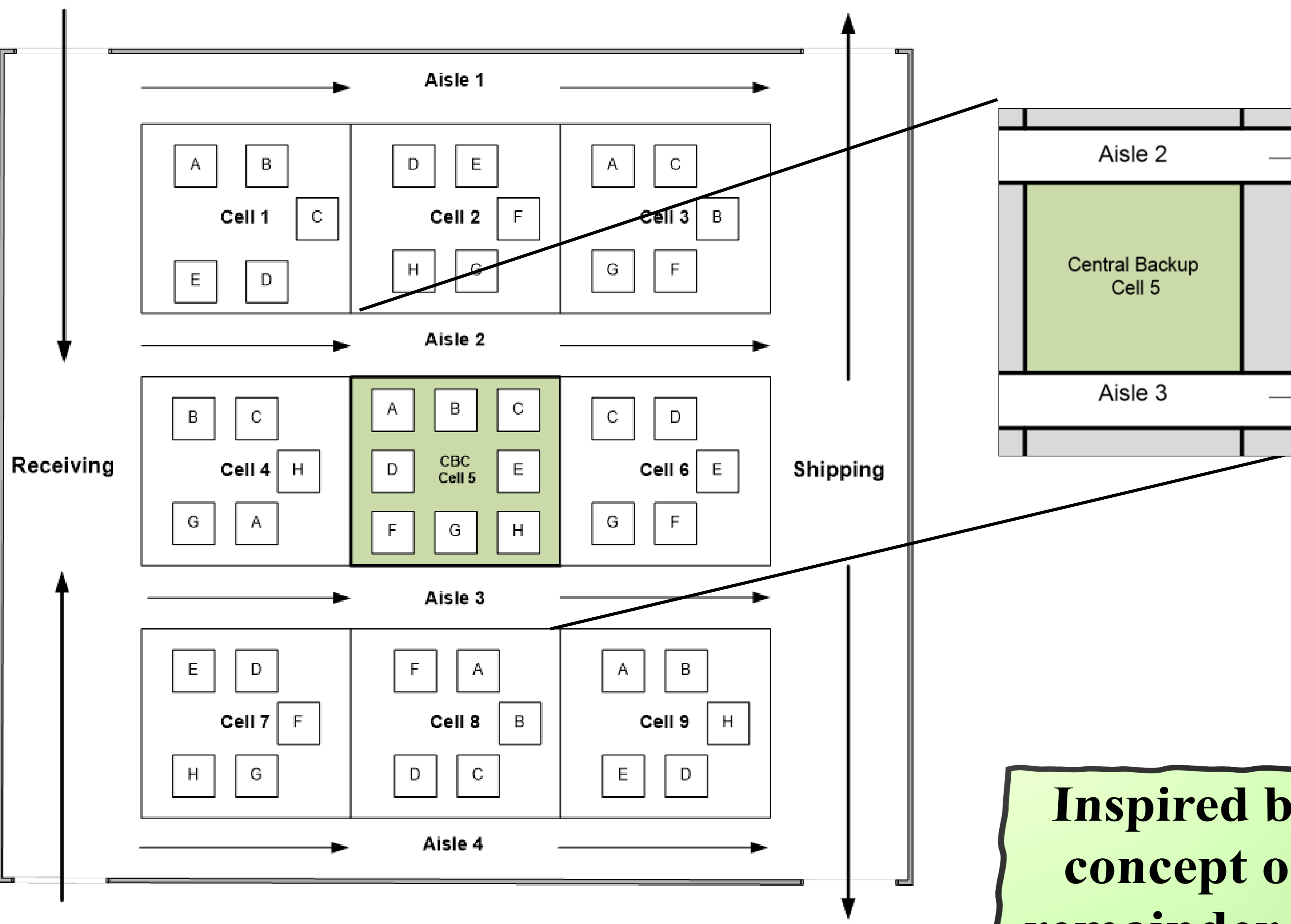
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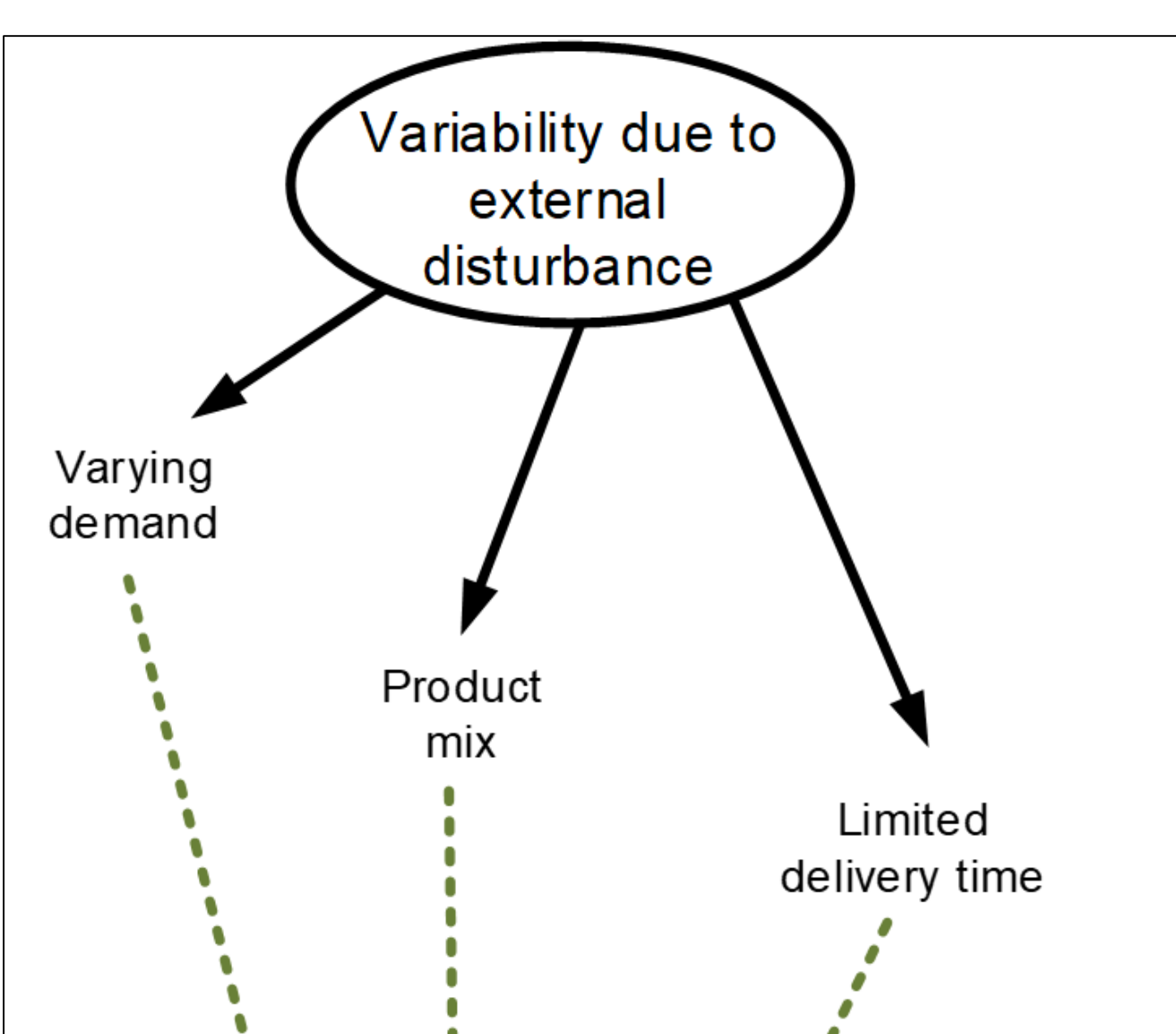
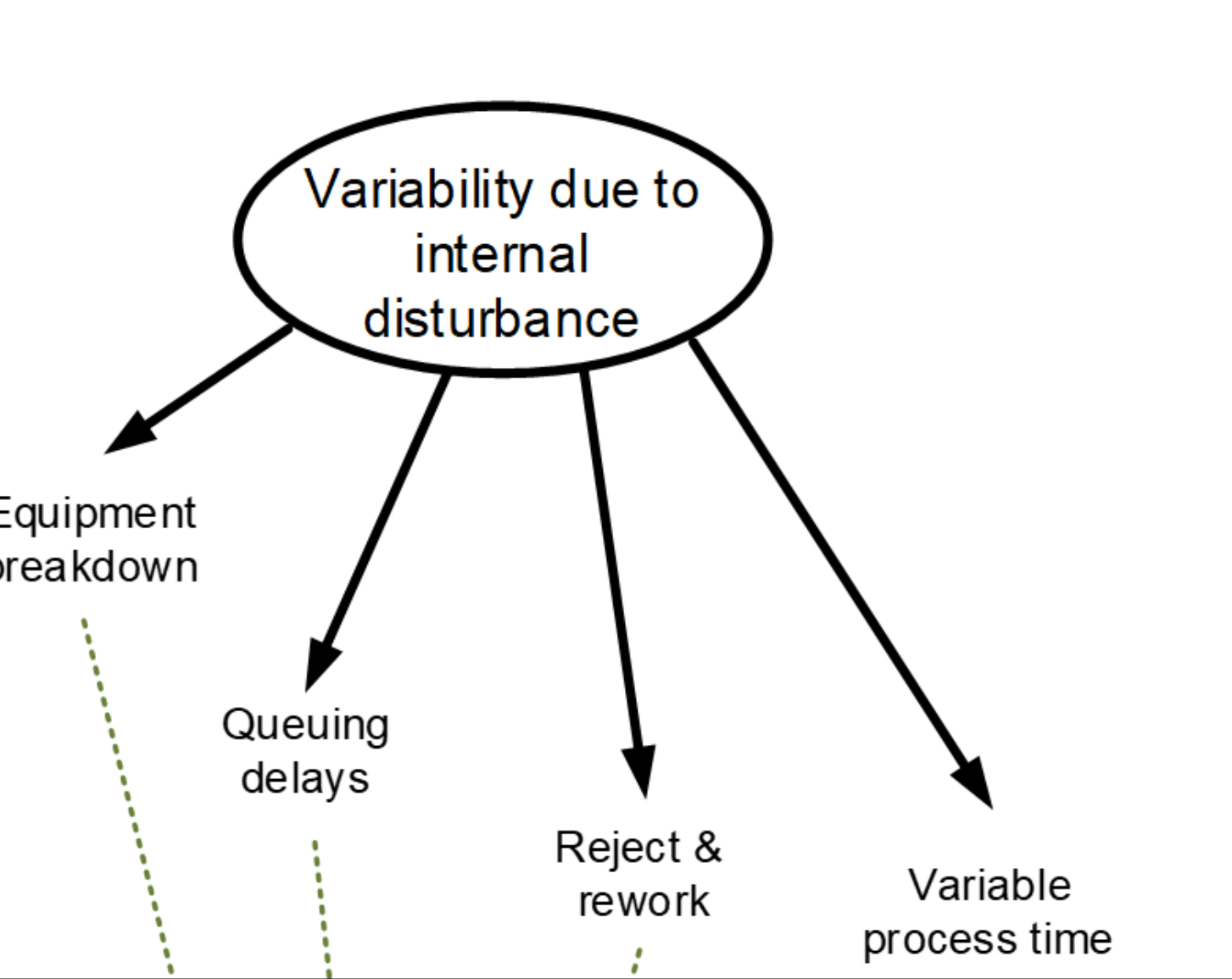
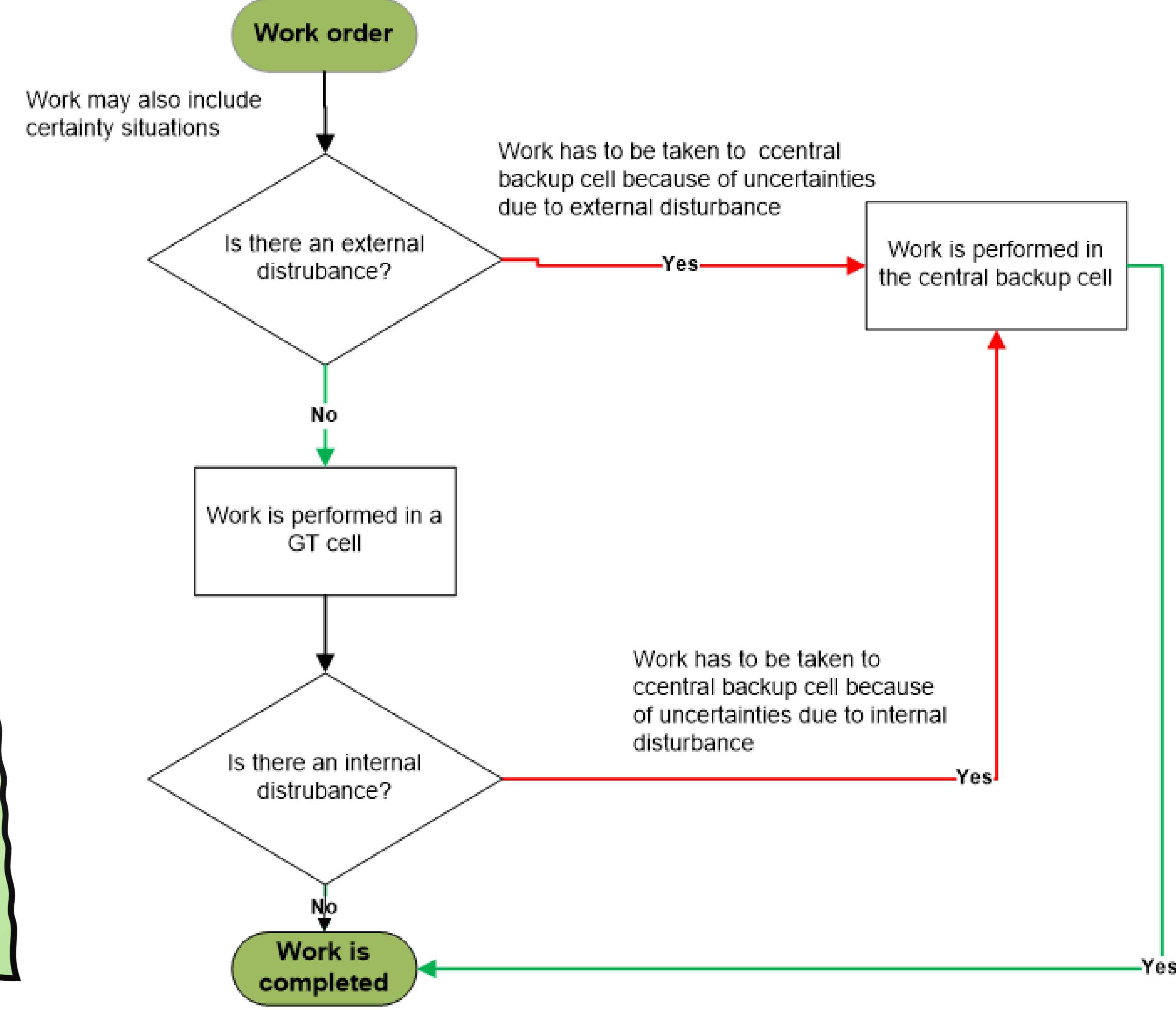
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Exploring new layout arrangement for facilities design by unifying Group Technology (GT) and Fractal layouts in cellular manufacturing.



The location of the central backup cell within the proposed CBCMS layout

Inspired by the concept of the remainder cell in GT

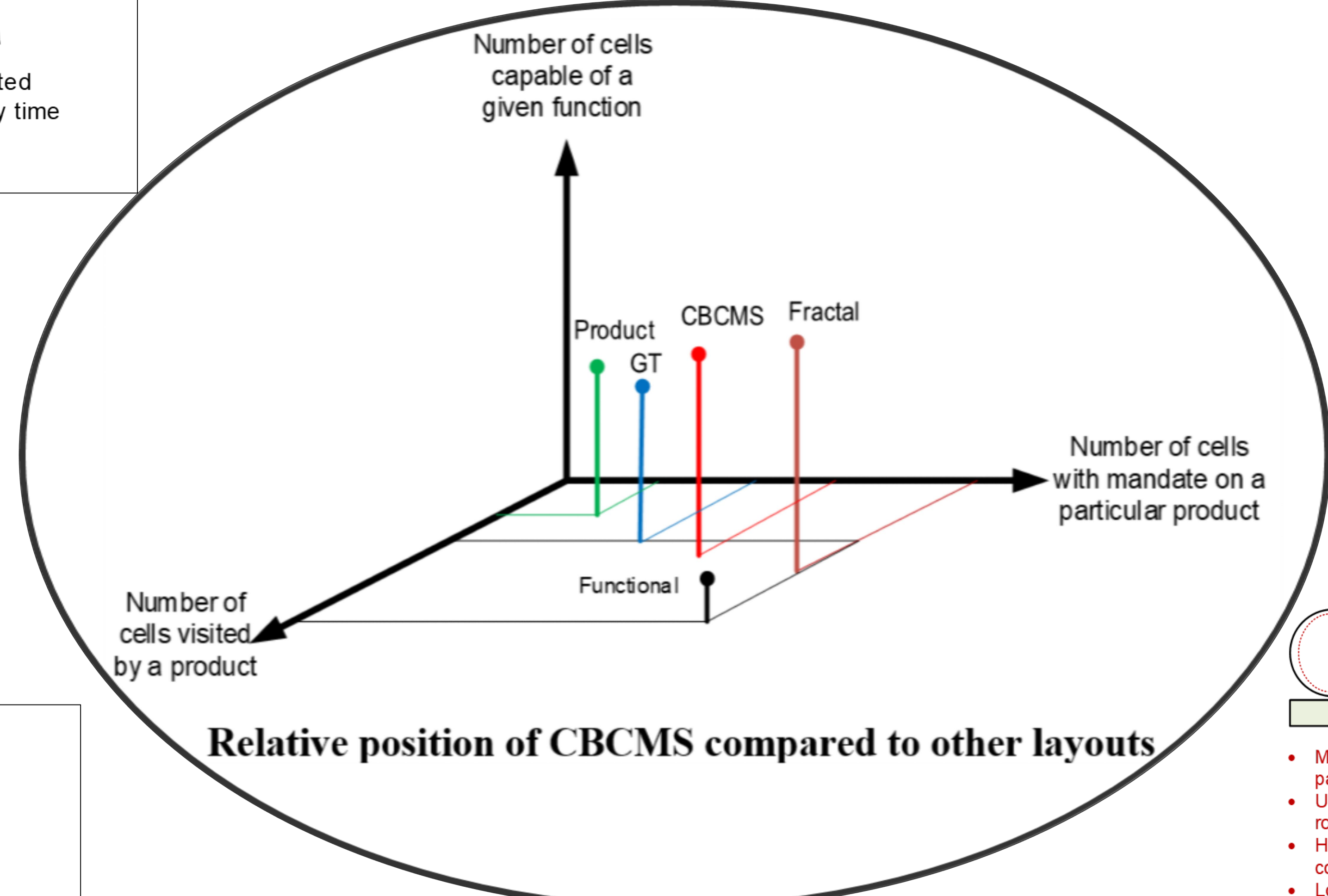


- Uncertainties due to internal disturbance** such as
- Equipment break downs
 - Queuing delays
 - Reject & rework
 - Variable task time

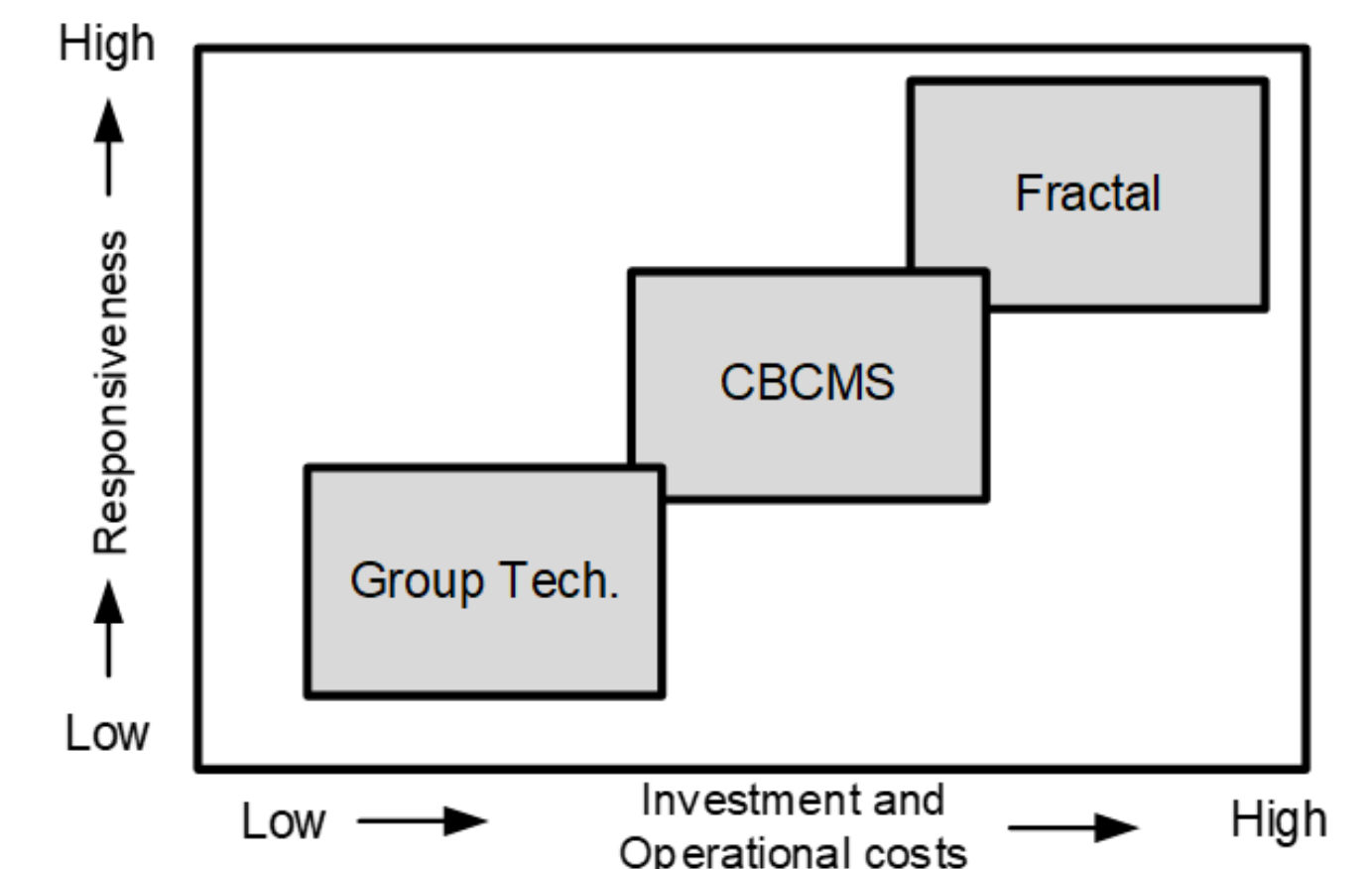
- Uncertainties due to external disturbance** such as
- Fluctuating demand
 - Product mix
 - Limited delivery time

- Other situations** such as
- Training programs
 - Making prototypes
 - Use as backup until expansion

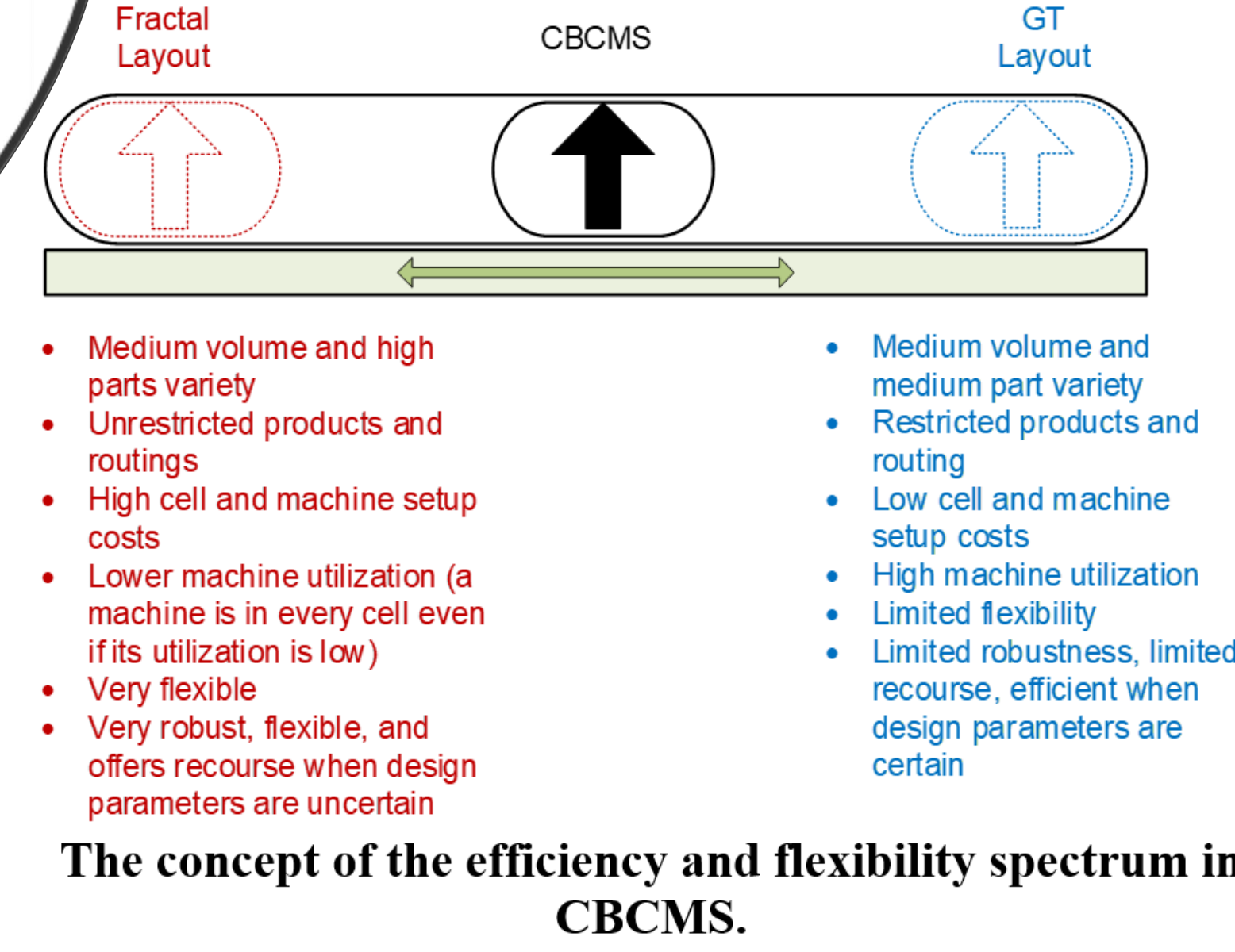
An approach for assigning work in a CBCMS environment



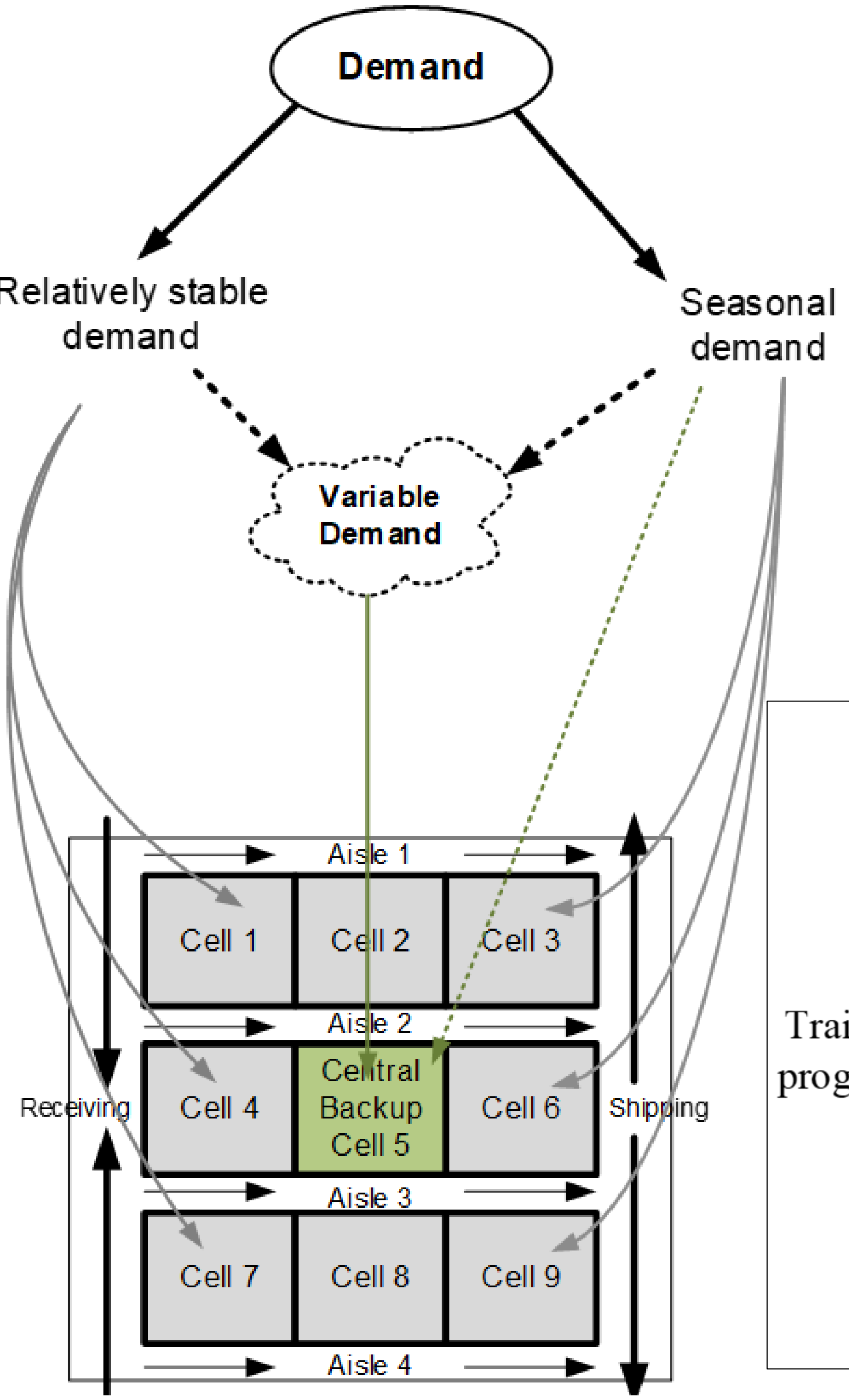
Relative position of CBCMS compared to other layouts



Cost and responsiveness relationship in GT, CBCMS, and fractal layouts.



The concept of the efficiency and flexibility spectrum in CBCMS.



Handling Variability

A mathematical model to help the designer develop a family of GT and Fractal Layouts using CBCMS as a starting point is presented in:
Salah Elaskari and Uday Venkatadri (2022), "Understanding the Design Continuum Between Group Technology and Fractal Cell Designs for Manufacturing Systems Through the Central Backup Cellular Manufacturing System," SN Operations Research Forum, Vol. 3