



# Keep your friends close and your enemies closer

Exploring channel development opportunities between fresh produce wholesale markets and dark kitchens as two-sided B2B platforms

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# Friends, foes or just strangers?



“The hidden jewel of the Birmingham economy”  
— Malcolm Harbour MEP <sup>[1]</sup>

## Birmingham wholesale market (BWM)

- Largest UK integrated market hosting 43 traders



- Substantive M-sized companies: avg. turnover ~£3.6m<sup>[1]</sup>
- ↓ units' occupancy: ~93% (2011)<sup>[1]</sup> vs ~85% (2025)

## ‘Dark’ or ‘Ghost’ kitchens (DK)

- Centralised facilities hosting commercial spaces for preparation of delivery-only meals<sup>[2]</sup>

DK		Tenants	
West Midlands	rest of England	West Midlands	rest of England
8	190	93	1,633

- Rising in popularity (~14% of online listings); growing demand for healthier options<sup>[3]</sup>
- High throughput: ~2,000 meals/DK/day; regulatory concerns e.g., transparency/safety<sup>[4]</sup>



Sources: <sup>[1]</sup>Forrest, P. (2011). *The Birmingham Wholesale fresh produce markets: The Essential Catalyst*. BWFPA Report;

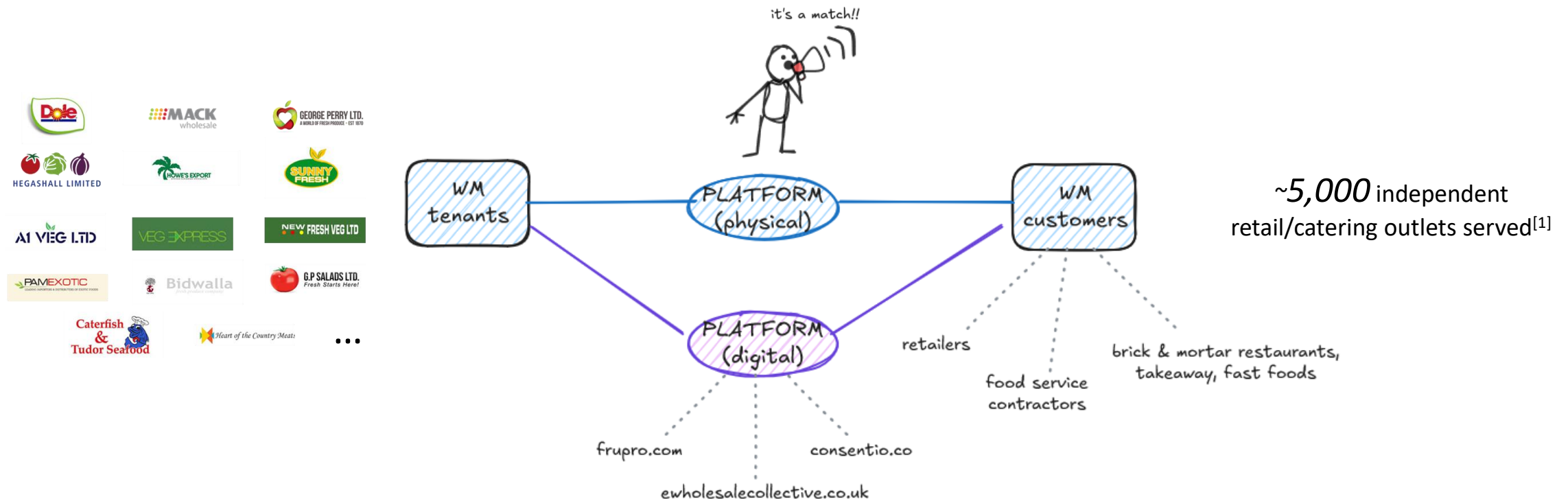
<sup>[2]</sup>Huang, Y. et al (2025). Understanding the socio-spatial distribution of “dark retail” in England: Development of a unique retail location dataset.

*Health & Place*, 94, doi:10.1016/j.healthplace.2025.103462; <sup>[3]</sup>Parmar O. (2025). *Online Food Ordering & Delivery Platforms in the UK*: IBISWorld

Report SP0.040; <sup>[4]</sup> Barakat, S. et al. (2021) *Food in the digital platform economy*. FSA Report. <https://doi.org/10.46756/sci.fsa.jbr429>

# Wholesale markets as 2-sided B2B platforms

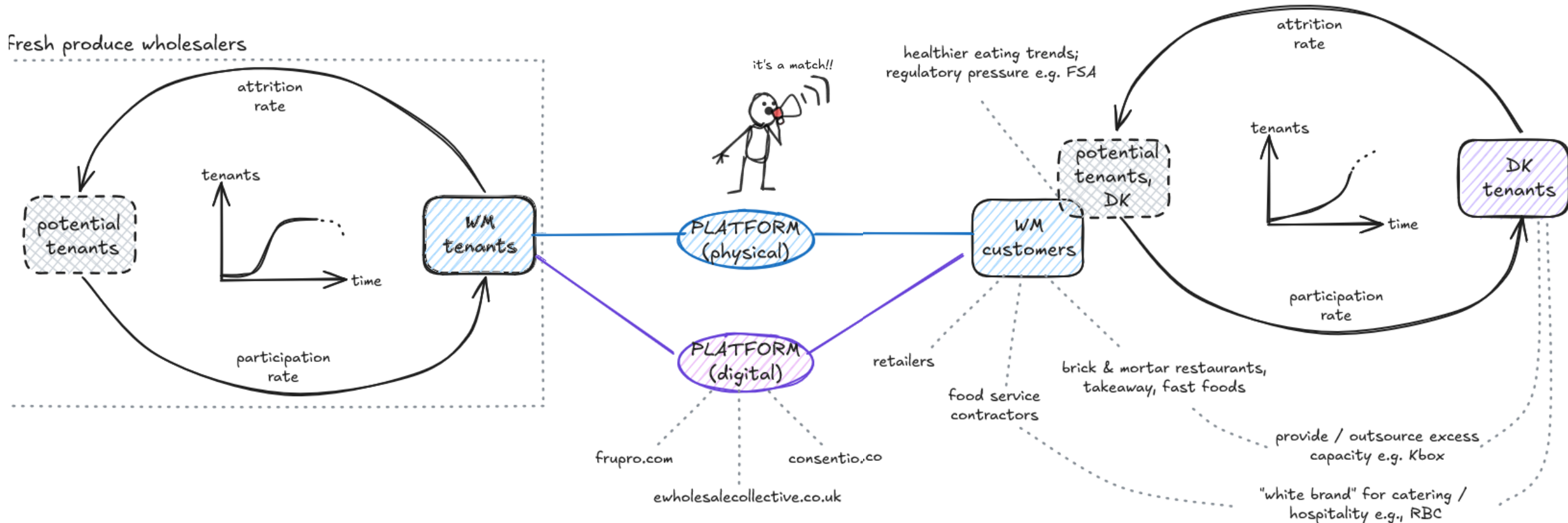
- Enables and actively manages interaction between participants
- “Network externalities”: a participant’s decision as to how much to interact affected by other participant’s decisions.



[1] Forrest, Paul. (2011). *The Birmingham Wholesale fresh produce markets: The Essential Catalyst*. Birmingham Wholesale Fresh Produce Association

# Digital disruptors: new channels exploration

- Demand growth drivers<sup>[1]</sup>: (i) F&V retail/supermarkets (↑7.5%); (ii) health-consciousness (↑0.5%); Organic and ethical sourcing
- Scenario: linking fresh produce wholesaling and dark kitchen digital disruptors as “B2B platforms”



[1] Lang, J. (2022) *Fruit & Vegetable Wholesaling in the UK*: IBISWorld INDUSTRY REPORT, G46.310.

## Intervention:

Explore channel development opportunities between wholesalers and digital disruptors

- New conceptualisation of BWM as a two-sided B2B platform
- Value creation lens on platform features development driving participation
- Evaluate opportunities for the wider urban food system e.g. potential improvement of fresh contents in delivery-only downstream operations



## “Model laboratory” approach:

Facilitate model & scenario building and implementation through System Dynamics

- Combine empirical simulation (STRESS-SD framework) and group model building ‘scripts’ to identify key structural and behavioural aspects
- Deploy exploratory models to frame scenarios and elicit informants’ views
- Contribute to nascent literature developing protocols on experimentation conducted in computer-aided modelling environments<sup>[1]</sup>

[1] e.g.: Freebairn, L., Atkinson, J., Kelly, P., McDonnell, G., & Rychetnik, L. (2016). Simulation modelling as a tool for knowledge mobilisation in health policy settings: a case study protocol. *Health Research Policy and Systems*, 14(1). doi:10.1186/s12961-016-0143-y

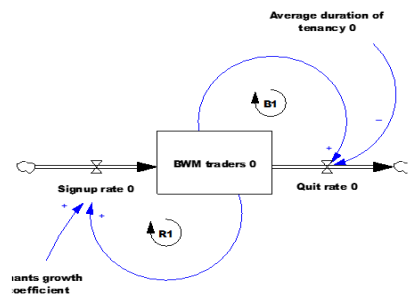
# “Multi-view” exploratory model



Maximising tenant’s participation

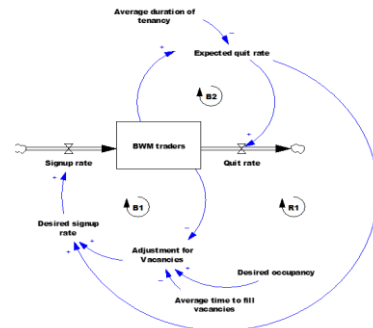


Maximising fresh produce (FP) throughput



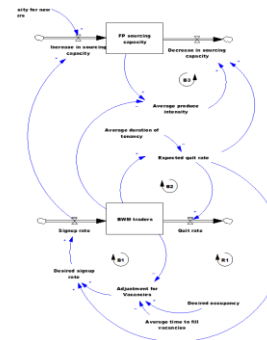
1: A stock of tenants

Population dynamics



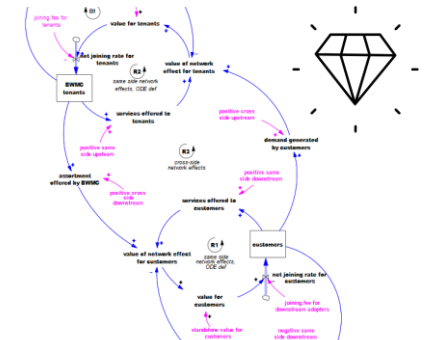
2: A goal seeking mechanism

Anchoring and adjusting heuristics



3: A stock of FP linked to a stock of tenants

Co-flow modelling

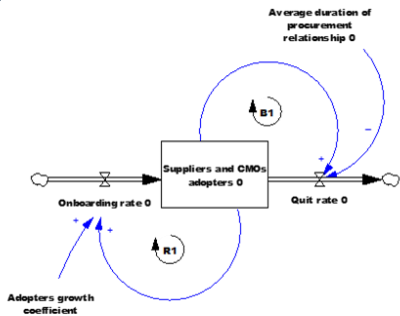


4: A 2-sided B2B platform

Value creation

# Example - conceptualising model structure

What might affect “arrivals” to and “departures” from the suppliers' side of the B2B platform?



## Modelling insights:

- Tenancy duration (~10 years) and renewal as proxy for retention
- Moderate crowding effect
- Footfall promotion and complementary services may enable same-side network effects

### Market General Manager

“Some of the new tenants just want to sell what others sell. We work with tenants to help control operational costs regardless of what they sell e.g., providing cost-effective waste management and affordable energy.”

### Director, managing company

“The market is exploring a shift to services and digital platforms to attract and anchor tenants and drive collective footfall. It is then up to customers to choose which traders to buy from.”

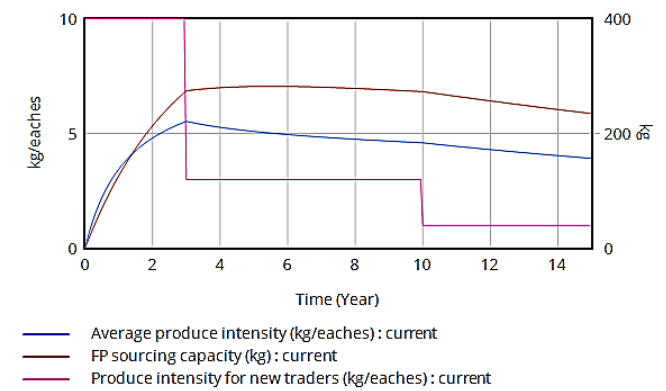
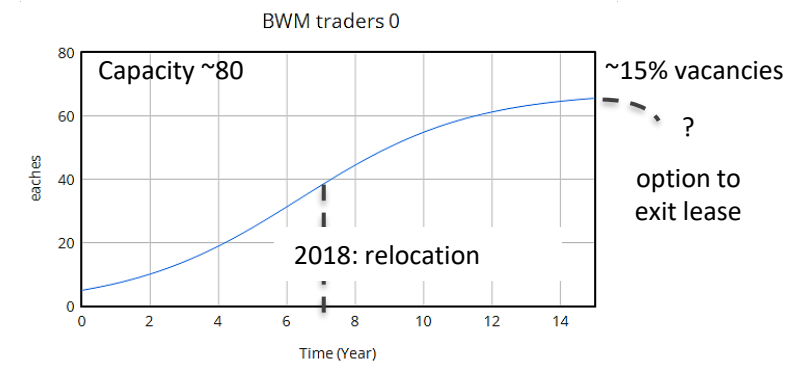
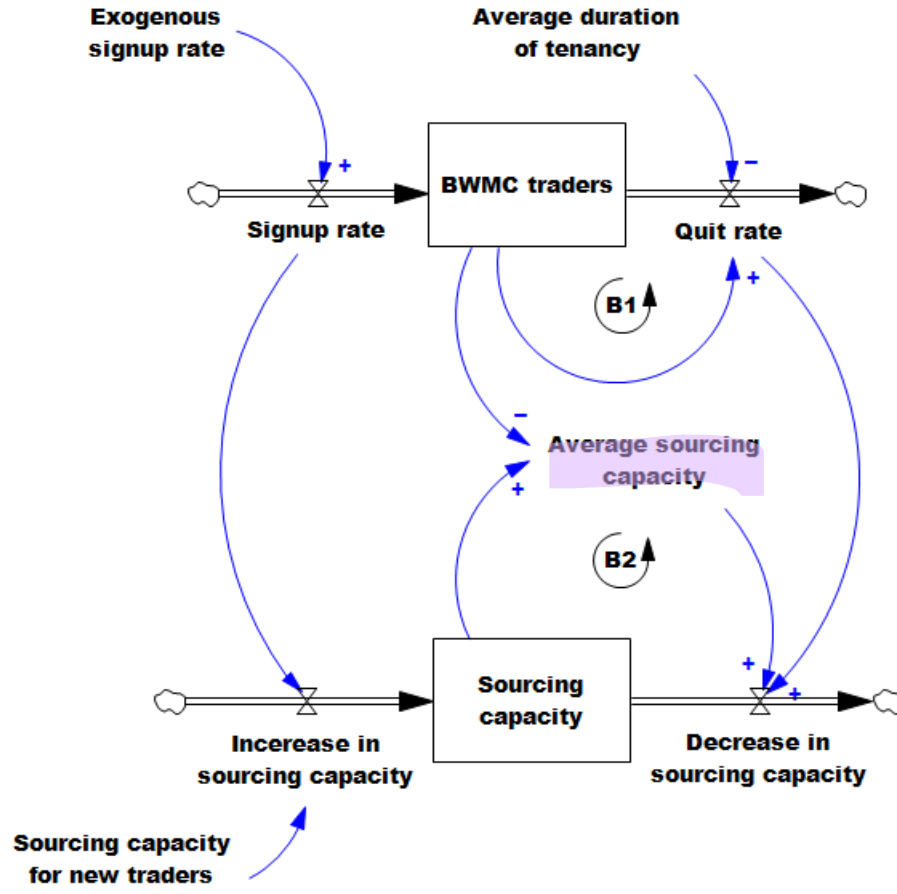
### Trader (established)

“New traders may find it challenging to come in due to credit line issues and long council approval times. Yet healthy competition is needed: competitors keep you on your toes.”

# Exploratory model snapshot: co-flows



more tenants  $\Rightarrow$  more FP!!



# Towards a value creation perspective – supply side

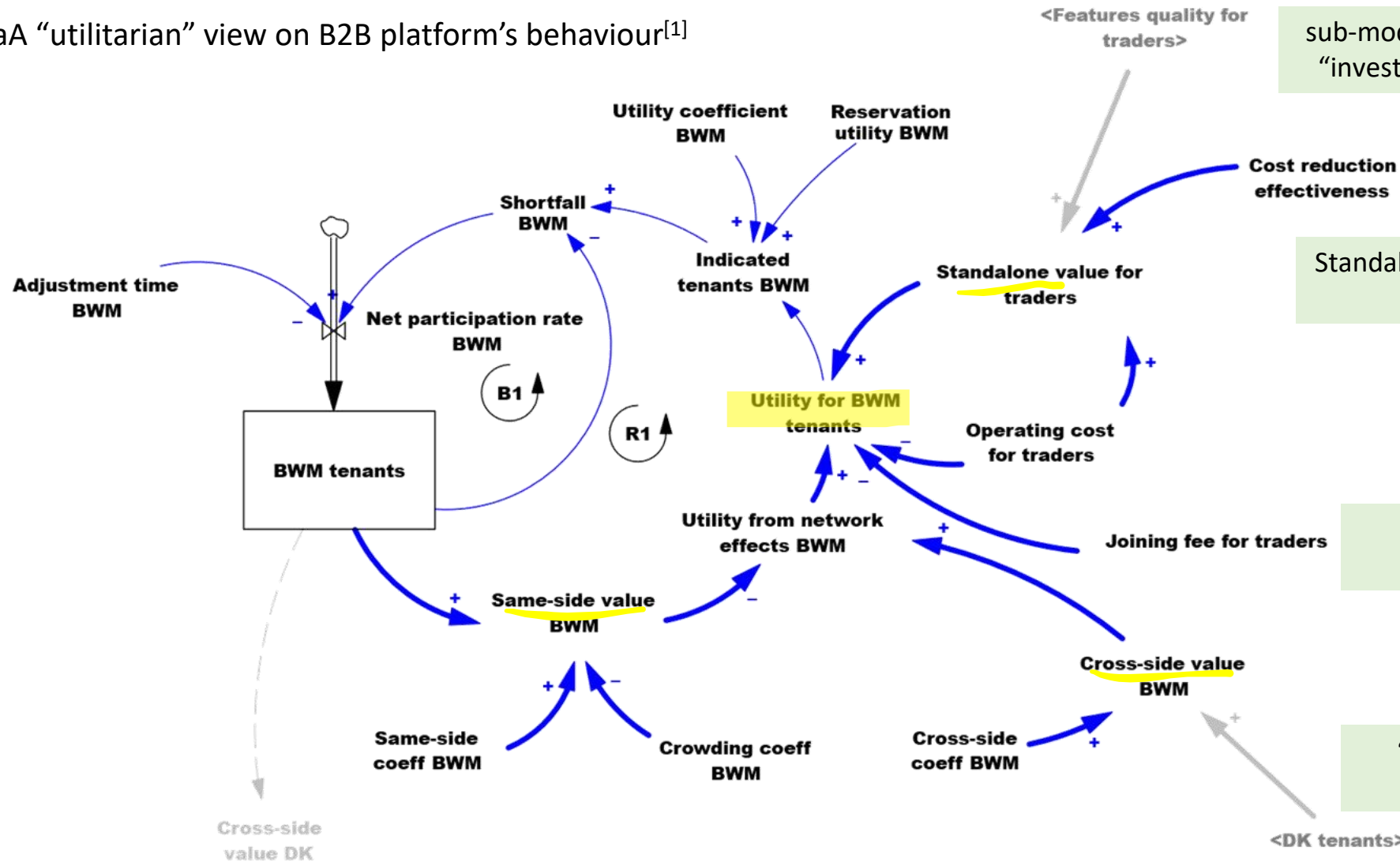
“VaA “utilitarian” view on B2B platform’s behaviour<sup>[1]</sup>

sub-model linking “features” to “investment” e.g., pulse train

Standalone value likely driven by “efficiency”

Room for “optimisation”?

“other” side: DK participation



<sup>[1]</sup>Revised model structure based on Anderson, E.G., Parker, G.G., Tan, B. (2023). Strategic Investments for Platform Launch and Ecosystem Growth: A Dynamic Analysis, *Journal of Management Information Systems*. 40(3), 807-839, DOI: 10.1080/07421222.2023.2229125

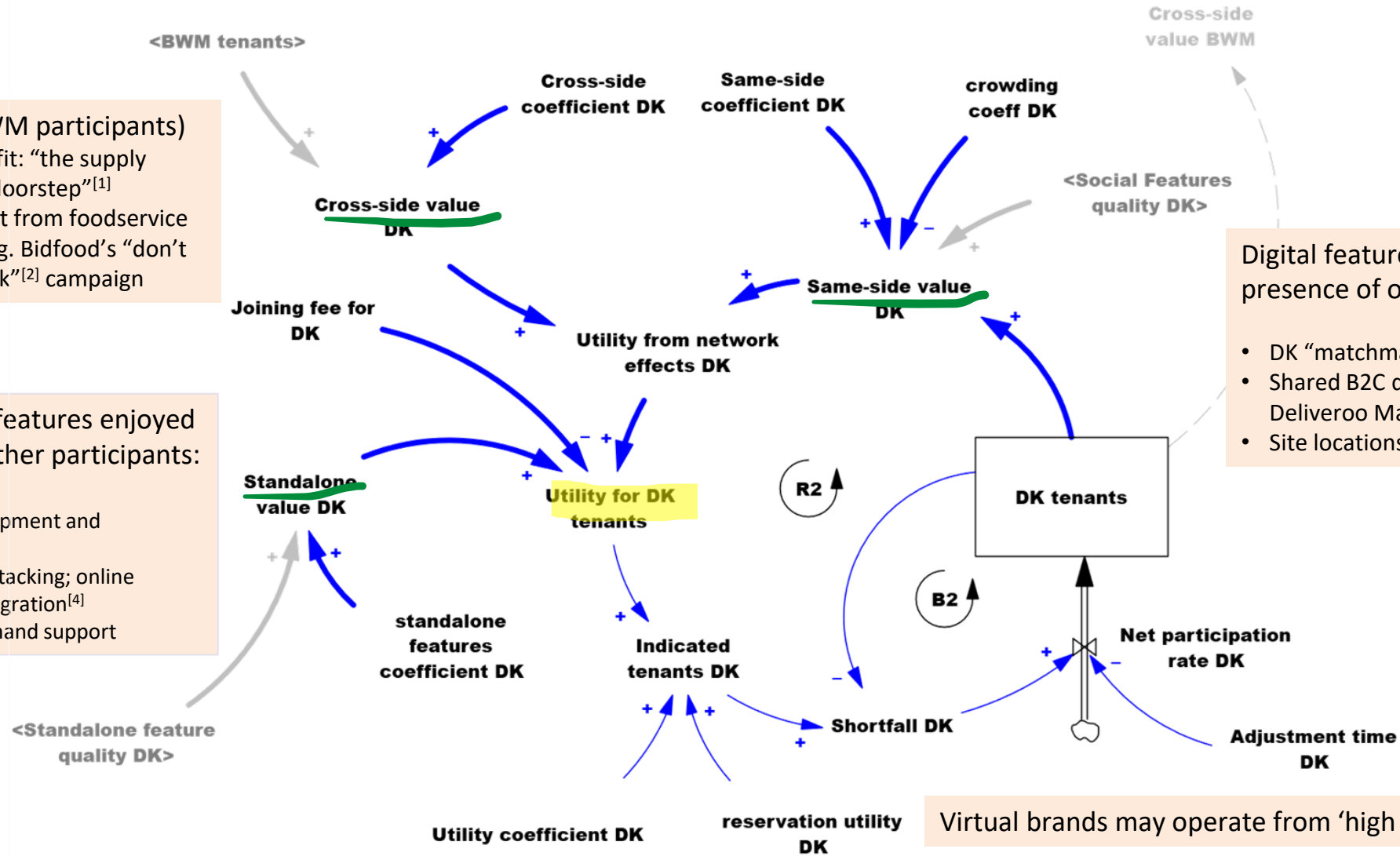
# Towards a value creation perspective – demand side

## Other side (BWM participants)

- Sourcing benefit: “the supply chain at your doorstep”<sup>[1]</sup>
- Explicit interest from foodservice wholesalers e.g. Bidfood’s “don’t hide in the dark”<sup>[2]</sup> campaign

## Wide range of features enjoyed regardless of other participants:

- physical e.g., equipment and configuration<sup>[3]</sup>;
- digital e.g., order tracking; online ordering APIs integration<sup>[4]</sup>
- Quality of on-demand support



## Digital features more beneficial in the presence of other participants

- DK “matchmaking” e.g. Oyakitchens<sup>[5]</sup>
- Shared B2C digital infrastructure (e.g. Deliveroo Marketplace+<sup>[4]</sup>);
- Site locations network for scale-up

Virtual brands may operate from ‘high street’ restaurants<sup>[6]</sup>

<sup>[1]</sup>Workshop with Griller Kitchens Birmingham at BWM; <sup>[2]</sup> <https://www.bidfood.co.uk/dark-kitchens/>; <sup>[3]</sup> See e.g. Dephna’s and Karma Kitchens’ value propositions; <sup>[4]</sup> <https://merchants.deliveroo.com/what-we-offer/>; <sup>[5]</sup> <https://www.oyakitchens.com/>; <sup>[6]</sup> Huang et al.(2025). doi:10.1016/j.healthplace.2025.103462

# Wrap-up

- Follow-up Group Model Building iterations at BWM
- Challenging engagement with DK: expanding beyond B'ham
- SD model finalisation
- Dissemination planning

