

MERIT

Simulating the business of
construction

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Hong Kong Poly University



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Aims of the seminar

- Overview of MERIT
- Key decisions
- Stages of operation
- MERIT support
- Some past results



Key features



The MERIT simulation introduces many of the key concepts and problems faced in the Construction Industry today:-

- The importance of forming a company strategy
- The need for effective teamwork and communication skills
- Ways of measuring company performance
- Controlling the company's finances, and looking after shareholder interests
- Managing the company's overheads



Key features (cont.)



The MERIT simulation introduces many of the key concepts and problems faced in the Construction Industry today:-

- The importance of Marketing, and the need for accuracy in estimating
- Different procurement methods, including traditional lump sum and design & build
- Building relationships with clients, and using external consultants
- Managing the construction of a project to completion, and managing risk
- Personal management, and picking the right people for the job



Overview of MERIT



- **MERIT was designed to introduce young professional engineers with a predominately technical training to company, business and financial management in a construction context**
- **MERIT is the simulation of the management of a construction company**
- **Teams of up to six acting as a board of directors take all decisions relating the management of their simulated company**



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Overview of MERIT (cont.)



- Whilst the primary training aim was company, business and financial management there are powerful, or even more important, lessons in disciplined decision making and leadership
- Disciplined decision making is required so that all consequences of decisions are understood.
- Leadership ensures every team member contributes



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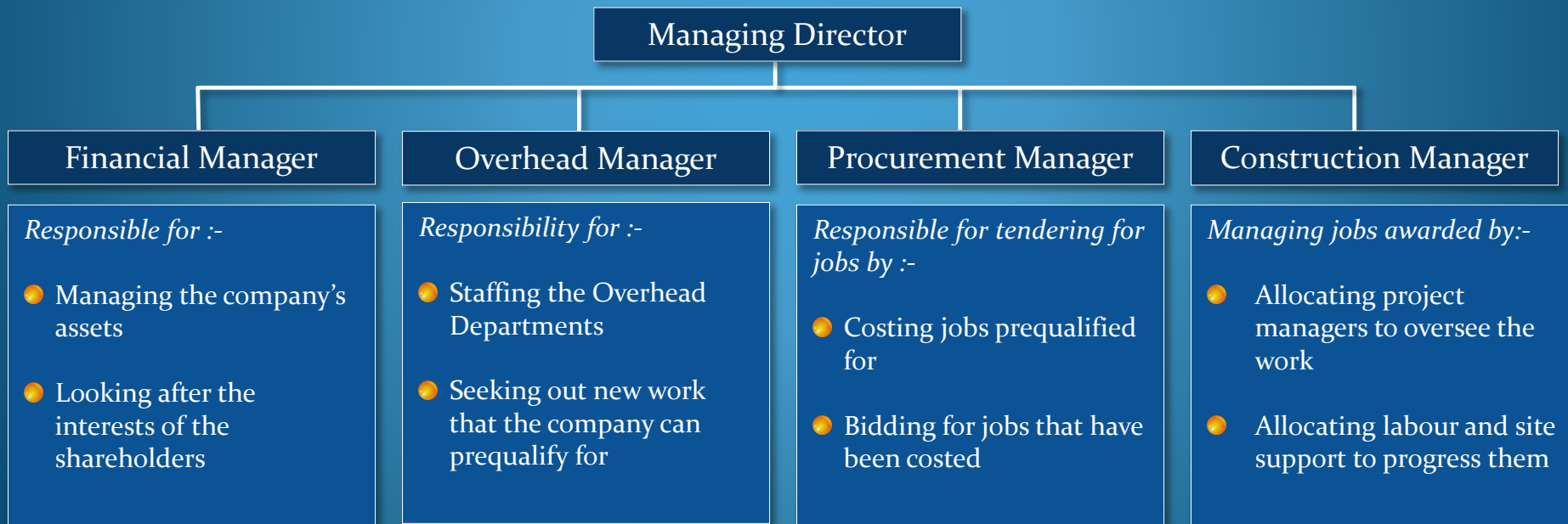
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Teamwork



The MERIT simulation has been designed to encourage the separation of team member responsibilities into different managerial functions to foster better teamworking, and the success or failure of the company may well depend upon the effective interaction between the different factions.

For example, a typical scenario for the structure of a team might be :-





To succeed the advice is:

- Think like directors
- Act like directors
- Be directors



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The MERIT experience



- Participative active learning
- Provides the simulated experience of operating at the highest level of company management—not gained in other training mediums
- Raises the horizons and ambitions of participants
- Guides selection of choice of future training.



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Sir John Armitt

Senior Vice-President of the ICE said to the 2015 finalists:

“ Self-belief is very important in business. I am getting to the end of my career, you are at the start. You’ll always remember this event. I’m sure it will help you. Now you can go back to your businesses, fired up and full of self-belief! ”



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MERIT statistics

- MERIT used as ICE annual game since 1988
- MERIT 2015 was the 25th game
- Student version of MERIT used as CIOB's Global Student Challenge since 2014
- MERIT used as dedicated games in degree programmes and in-house company training
- In total over 26,500 have participated in MERIT training
- Over 250 Companies have sponsored teams



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MERIT statistics (cont.)



The most successful companies are:

Arup

and

Mott MacDonald

Both have won:

3 Championships and 3 Sponsored Awards



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MERIT statistics (cont.)



Companies represented here today that have previously played MERIT:

Sponsor	Teams	Players	Sponsor	Teams	Players
AECOM	68	370	Jacobs	108	606
Arup	132	738	Laing O'Rourke	13	71
Atkins	248	1372	Mott MacDonald	133	729
Buro Happold	12	103	MTR	4	24
CH2M	1	6	Parsons Brinkerhoff	116	629
Gammon Construction	7	36	Tony Gee & Partners	13	71
Halcrow	66	371	Vinci Construction	5	25
Hyder Consulting	54	300			



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Company Strategy



The decisions made each period need to be based upon a sound company strategy which reflects :-

- The objectives of the Company
- How the objectives are to be achieved

In order to decide upon the objectives, and what can be realistically achieved, there needs to be a detailed analysis of :-

- The environment in which the company is operating
- The strengths and weaknesses of the business as it stands
- The likely competition in the future



Company Strategy (cont.)



The areas that need to be considered in the company's strategy include :-

- What level of growth the company should aim for
- What to do with any cash reserves
- What staffing levels are required for the company's overhead departments
- Which market sectors the company wishes to target
- What level of margin to aim for during tendering
- What type of labour to employ to progress jobs



The Key Decisions



The key decisions that have to be made each period relate to :-

- The company's overhead departments
- Procuring work
- Progressing each contract awarded
- The company's finances



Head Office

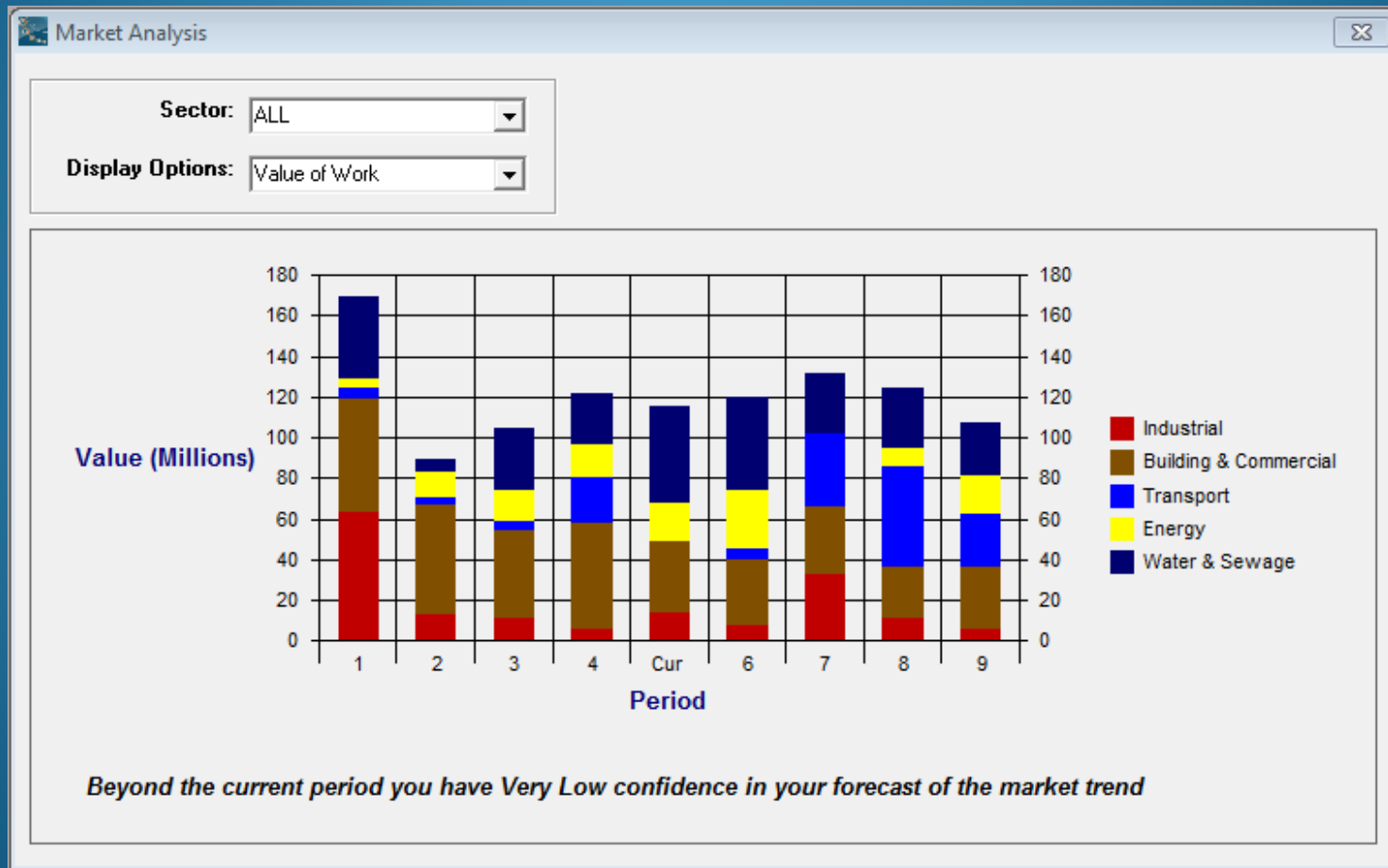


- **Marketing:** *Too little reduced bidding opportunities*
- **Estimating:** *Too little unable to estimate adequately for all bids*
- **QHSE:** *Too little reduces quality and safety increases costs*
- **Measurement:** *Too little under-recover income on projects*
- **Head Office general staff:** *Too little reduces efficiency*

- **BUT too much increases overheads**



Marketing



Procuring work



- Preparing estimates for projects for which pre-qualified
- Estimating effort-too little the estimate may not be accurate.
- A low estimate -too low client will reject-low and wins may lose money
- A high estimate —won't have a winning bid



Procuring bid

- Add project on-costs
- Add project manager costs
- Add profit margin

Will this win the contract?

Only if lowest but not too low to be unrealistic-only if the company has the capacity



Progressing projects awarded



- **Selecting project manager**
- **Allocating site staff (on-costs)**
- **Allocating labour**
 - Own labour from other projects or idle labour pool immediately fully operational
 - Own labour newly recruited needs training
 - Sub-contract labour immediately operational, no pay-off costs but more expensive



Company finances

- **Cash account**

Projects have income delays and retention generate a cash demand—if not cash rich the company may need to borrow

- **Capital base (plant, assets etc)**

The capital base measures the company's turnover capability ie its ability to take on projects



Capital base

- A company is capable of taking on work up to a turnover/capital ratio of 9
- Between 9 and 11 the company may be awarded a new contract if they have a good record with the client
- Above a ratio of 11 the company is too over stretched to take on new work—needs new capital --retained profits?—borrowing?



Capital base (cont.)



- A turnover/capital ratio of say 5 mean that the company's capital assets are not working hard enough---assets lying idle
- Pay off borrowings if you have any
- More turnover-if you can win work
- Invest your capital in schemes outside the company



Investments

- The Company has the opportunity to invest in projects-may give a better return than their own work
- Uses excess capital





Profits

There are four demands on company profits

Compulsory:

1. Interest charges on borrowed capital
2. Corporation tax

Discretionary:

3. Retained profits to
 - a) offset depreciation in assets and
 - b) to boost capital base
4. Dividends to shareholder to reward company owners

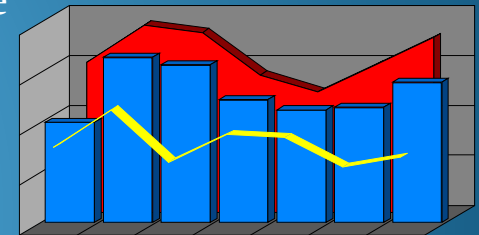


Measuring the Company's Progress



A number of key performance indicators are used to measure the progress of a company :-

- Turnover
- Gross Profit to Turnover ratio
- Operating Profit to Turnover ratio
- Company Value
- Capital Employed
- Contract Completion Rate
- Forward Workload
- Forward Margin
- Share Price
- Client Satisfaction



The indicators are all weighted at the start of the early years to reflect their variability, and initially sum to 1000.

Per	Total	Turnover	Gross Profit to Turnover	Operating Profit to Turnover	Company Value	Capital Employed	Contract Completion	Forward Workload	Forward Margin	Share Price	Client Satisfaction
4	1000	80	90	120	130	100	100	80	90	110	100

As each period passes so the indicators rise and fall, with the total giving an overall indication of the company's progress.



The Stages of MERIT



- ***Trialling:***

Allows teams to learn the software and the principles of company, business and financial management

- ***Phase 1: The Early Years:***

Teams run their simulated company as a board of directors. Each round is a quarters trading.
In this phase teams are competing against the simulation.

- ***Phase 2: The Final Years:***

The teams that qualify for the final now compete against the simulation and each other. It is much more competitive.



Team data files

- At the start and end of each round teams are given a data file describing the status of their company
- An external consultants report on the company is included within the data file
- Teams are required each round to submit their decisions relating to the management of their company via the data file



Performance report



At the end of each round a leaderboard is published

MERIT 2015 - Period 12				
Position	Team	Sponsor	Total Rating	% Improve.
1	Strike while the iron is Mott	Mott MacDonald	5788	14
2	Amazing	Atkins Asia Pacific	5291	11
3	Singularity	WS Atkins India	5200	7
4	Ubiquitous	WS Atkins India	4940	12
5	Beagle 2	Interserve	4881	10
6	Arupians take NYC	Arup	4629	9
7	3038 Construction	AECOM	4542	9
8	Salt On The Road	EM Highways Services Ltd	4472	12
9	Go Big	Aurecon Australasia Pty Ltd	4452	8
10	Alpha Engineers	Hyder Consulting (UK) Ltd	4359	6
11	Fissionman's Friends	Cavendish Nuclear	4356	10
12	AECOM and get some!	AECOM	4312	9
13	AECOMplete Shambles	AECOM	4311	6
14	Red Mott Chili Peppers	Mott MacDonald	4303	10
15	Like a boss	Mott MacDonald	4289	12



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MERIT support



The learning aspects of Merit are enhanced in a number of ways :-

- An interactive searchable tutorial, in the form of a slideshow, guides the user through the simulation
- A detailed set of company reports are available in different formats
- Feedback is given each round about company performance in each business area from an external consultant
- Overall company performance is measured by key performance indicators and company performance statistics that are available at all times



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Tutorial

Entering Overhead Marketing Decisions - 3

Client Relationships and Prequalification
 Client Relationships play a role in prequalifying for work in two ways -

- If the relationship is an **improving one**, and at least at a certain level, the company may prequalify for a job that would have been unattainable, as shown in the External Performance Review.
- If the relationship is a **deteriorating one**, then there is a chance the client will not allow prequalification, regardless of the effort being put into the particular job sector.

External Performance Review

Period: Period 3
 Category: Quarterly

Click on any Client Relationship to view details. If an empty client relationship is consulted, you will be able to report the company's performance to support the company's turnover. All costs across all jobs have been reduced because clients will be able to support the company's turnover. Increased sales have increased due to the relationship with the Client. Client's own sales have increased due to the relationship with the Client.

Factors that affect Share Price

Dividend payments
 Dividends are taxable payments declared by a company's board of directors and given to its shareholders, normally quarterly. They provide an incentive to own stock in stable companies even if they are not experiencing much growth. Dividend payments are based upon the current share price.

The **equity** of the company at any time is the overall share value. The number of shares in circulation multiplies share price.

There is a level of the equity, at which **change** paying dividends will cause the share price to fall. The price will not be well and the price will fall.

Dividend payments made each period - **Shareholders are "dividend paid"** at price.

If dividend has had what about other factors?

Factors Affecting Share Price

Dividend Payment	Share Price	Dividend Yield
1.0000	10.0000	10.0000%
1.0000	10.0000	10.0000%
1.0000	10.0000	10.0000%
1.0000	10.0000	10.0000%
1.0000	10.0000	10.0000%
1.0000	10.0000	10.0000%
1.0000	10.0000	10.0000%
1.0000	10.0000	10.0000%
1.0000	10.0000	10.0000%
1.0000	10.0000	10.0000%

Share Price Movement

Calculating PI's - Operating Profit to Turnover ratio

By examining the **Financial Report** we first determine the turnover (measured value) and operating profit values for the History Year (periods 1-4).

- The Historical turnover was **8,734,433**
- The Historical gross profit was **58,474**

The historical operating profit to turnover ratio was **0.0067** (58,474 / 8,734,433) and serves as the **benchmark** for any changes in the ratio in future periods.

The operating profit/turnover indicator weighting of **60** at the end of the performance indicator benchmark.

History Year
 The values were -
 Period 1: 8,734,433
 Period 2: 8,734,433
 Period 3: 8,734,433
 Period 4: 8,734,433

Operating Profit	Turnover
137,980 (1.7% of costs)	8,734,433
(less) Overheads: 248,210	
(less) Corporation Tax: 69,361 (20.06% Capital Allow. 20% rate)	
(less) Overhead Labour: 1,483 (1.2% per job from Cash A/C)	
Operating Profit: 248,937	

Labour Relations

Example 1: good labour relations in action

All 178 site labour transferred to site.

178 men were available in the idle labour pool, and none were laid off. Indeed, all 178 men were used on On-Going jobs.

No men were laid off from site.

No subcontractors were used.

The Construction Manager was able to manipulate the labour force so that -

- None of the company's own labour was laid off
- No subcontractors were used
- All idle labour was redeployed to site

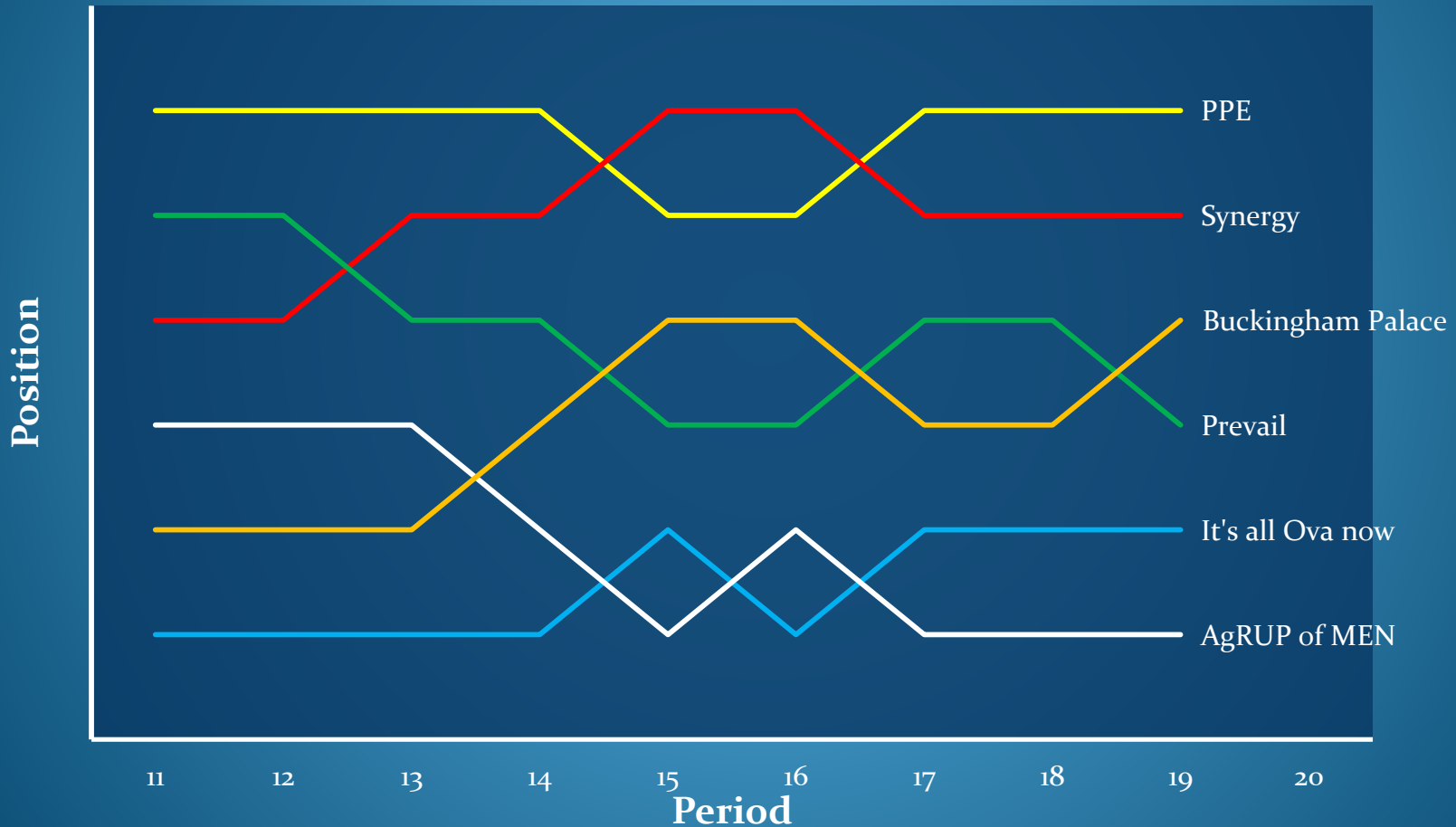
This is an example of **good labour relations**, and the productivity of the company's own labour would be improved.

Job	Last Period	This Period	Labour Allocation	Over-Labour	Turnover	Site Cost Allocation
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	0	0	0	0	0	0
4	0	0	0	0	0	0
5	0	0	0	0	0	0
6	0	0	0	0	0	0
7	0	0	0	0	0	0
8	0	0	0	0	0	0
9	0	0	0	0	0	0
10	0	0	0	0	0	0
11	0	0	0	0	0	0
12	0	0	0	0	0	0
13	0	0	0	0	0	0
14	0	0	0	0	0	0
15	0	0	0	0	0	0
16	0	0	0	0	0	0
17	0	0	0	0	0	0
18	0	0	0	0	0	0
19	0	0	0	0	0	0
20	0	0	0	0	0	0
21	0	0	0	0	0	0
22	0	0	0	0	0	0
23	0	0	0	0	0	0
24	0	0	0	0	0	0
25	0	0	0	0	0	0
26	0	0	0	0	0	0
27	0	0	0	0	0	0
28	0	0	0	0	0	0
29	0	0	0	0	0	0
30	0	0	0	0	0	0
31	0	0	0	0	0	0
32	0	0	0	0	0	0
33	0	0	0	0	0	0
34	0	0	0	0	0	0
35	0	0	0	0	0	0
36	0	0	0	0	0	0
37	0	0	0	0	0	0
38	0	0	0	0	0	0
39	0	0	0	0	0	0
40	0	0	0	0	0	0
41	0	0	0	0	0	0
42	0	0	0	0	0	0
43	0	0	0	0	0	0
44	0	0	0	0	0	0
45	0	0	0	0	0	0
46	0	0	0	0	0	0
47	0	0	0	0	0	0
48	0	0	0	0	0	0
49	0	0	0	0	0	0
50	0	0	0	0	0	0

MERIT 2014 period 19



— PPE — Synergy — Prevail
— It's all Ova now — AgRUP of MEN — Buckingham Palace



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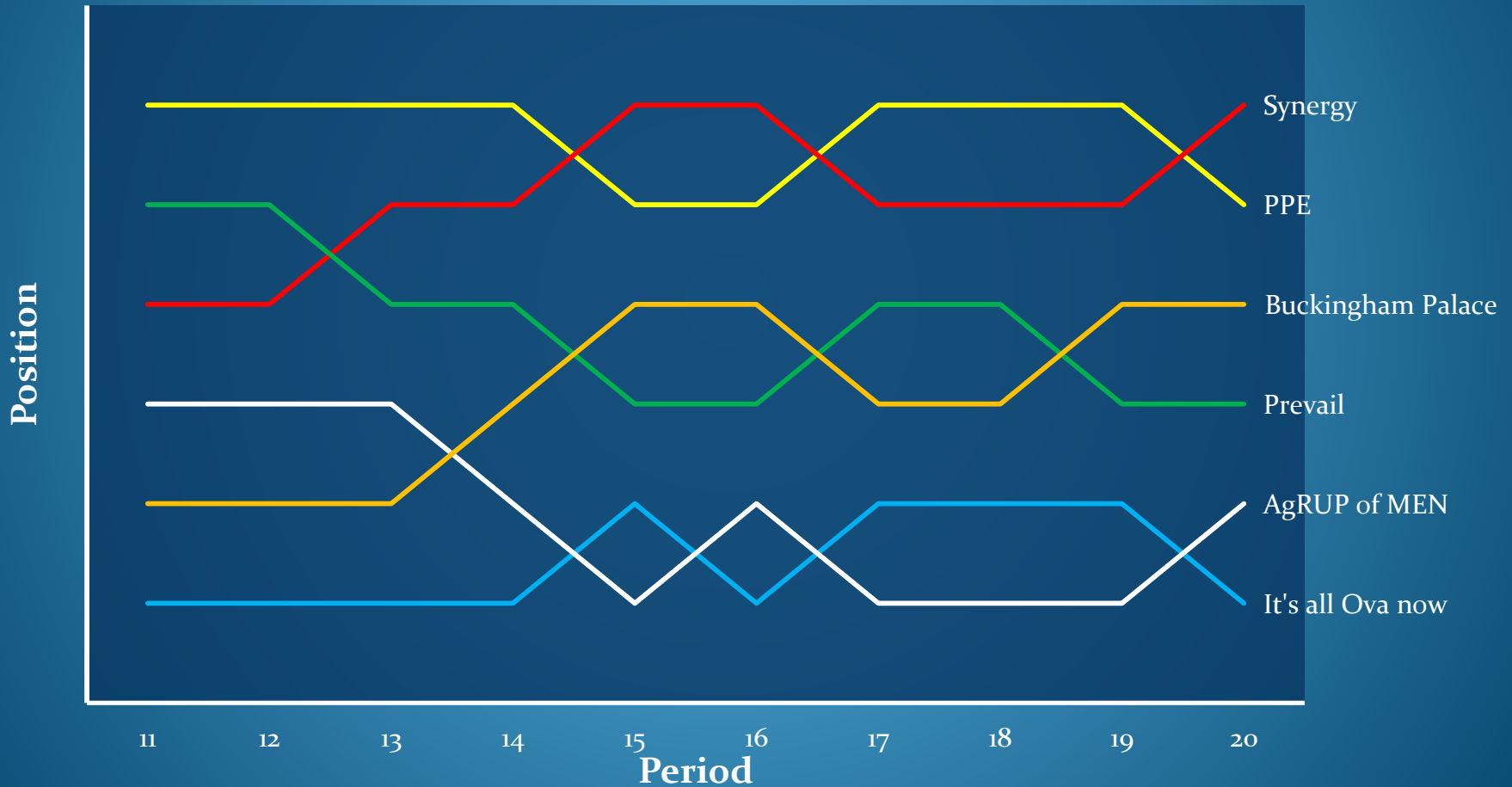


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MERIT 2014 period 20



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— It's all Ova now — AgRUP of MEN — Buckingham Palace



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MERIT 2014

The final positions announced



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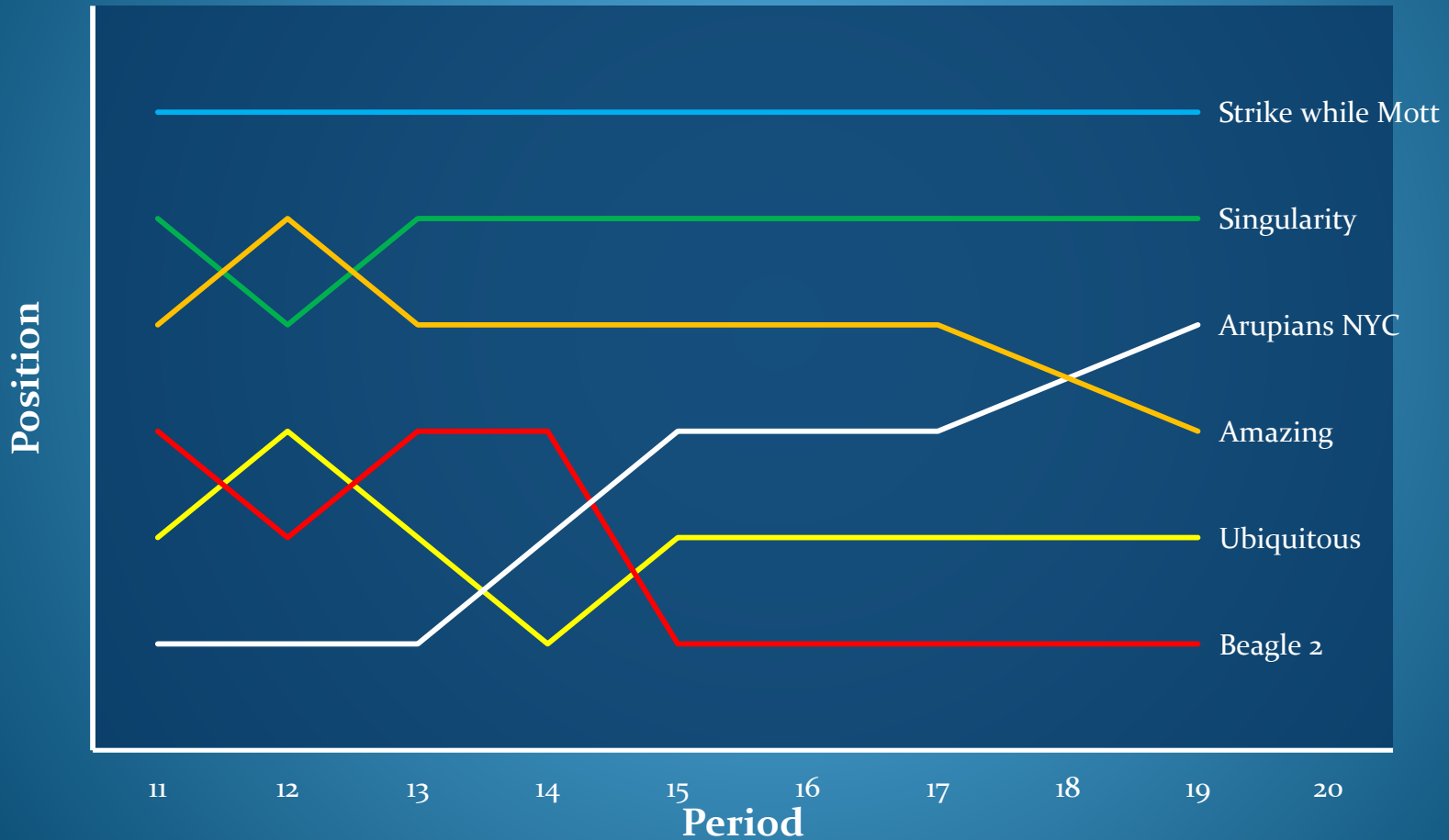


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Strike while Mott Arupians NYC Amazing



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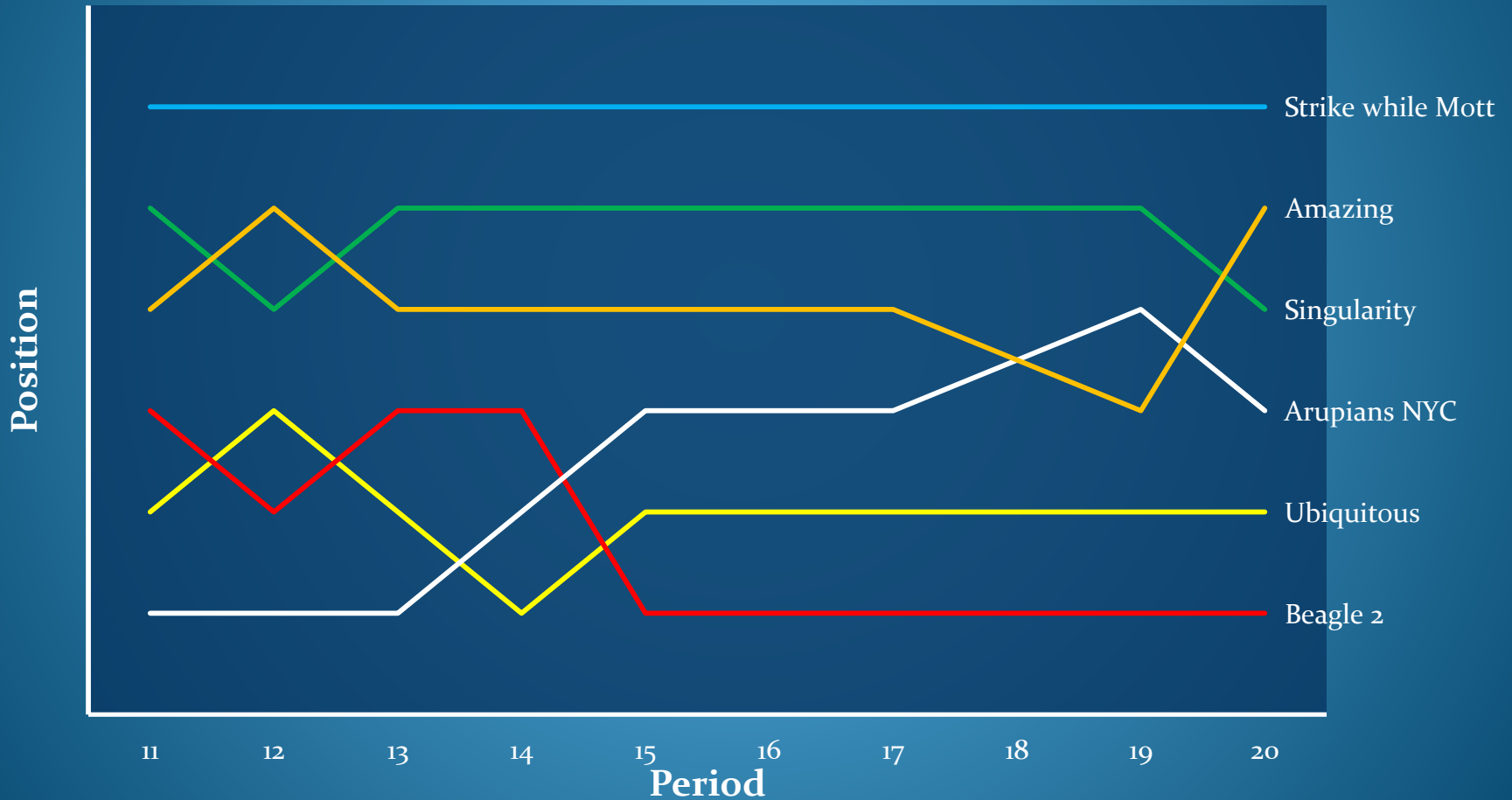


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MERIT 2015

'Amazing' receiving their award



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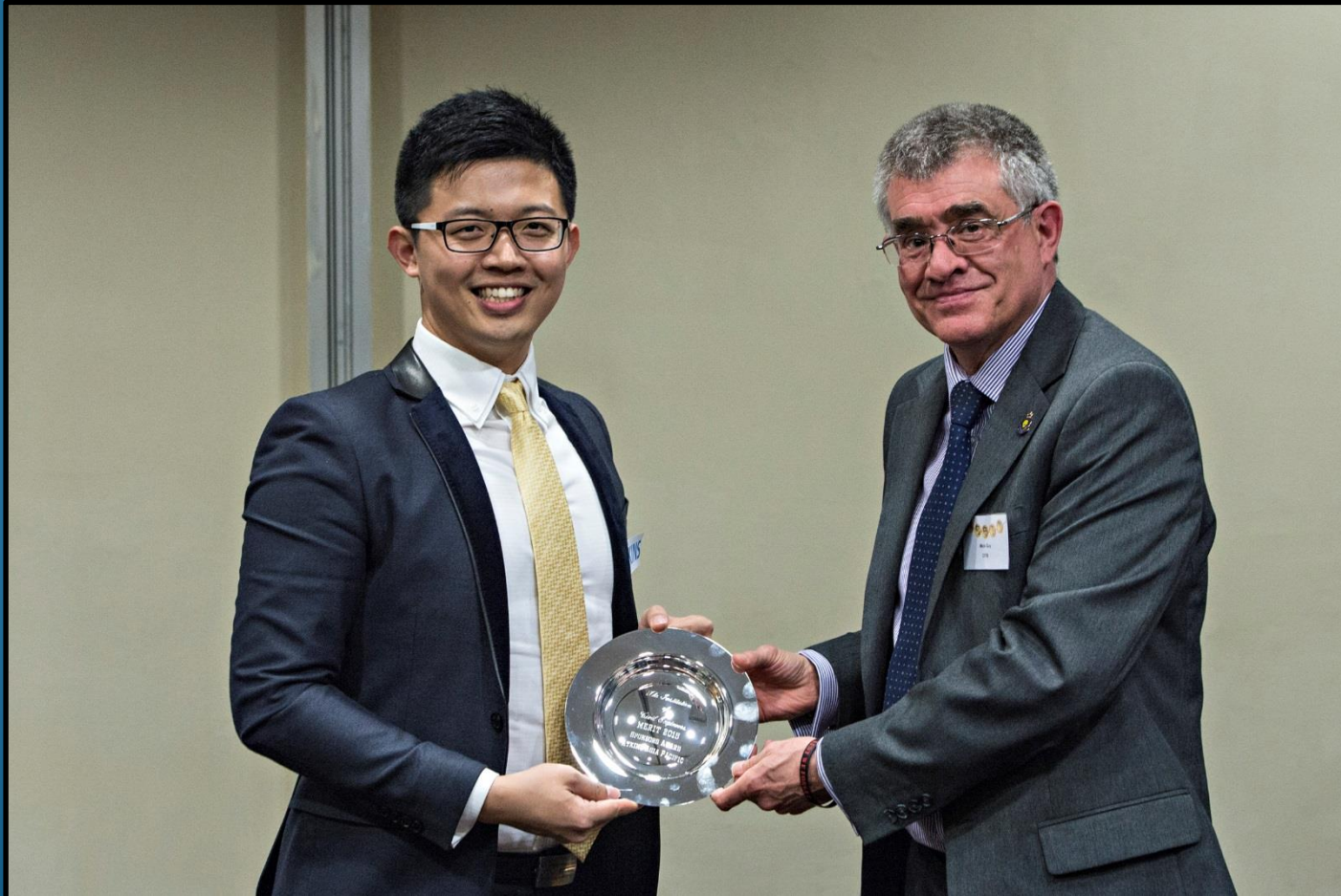
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MERIT 2015

Robert Huang receiving sponsors award



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MERIT 2015

The 25th Anniversary



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MERIT 2016



- Registration opens: October 2015
- Trialling opens: 04 January 2016
- First round submission: 24 February 2016
- Final: 12 & 13 May 2016

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To register interest for newsletter and to register to
play MERIT 2016



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