

# *Welcome*



## **Forecasting and Planning a Multi-Skilled Workforce:** *What You Need To Know*

*Presented by:*



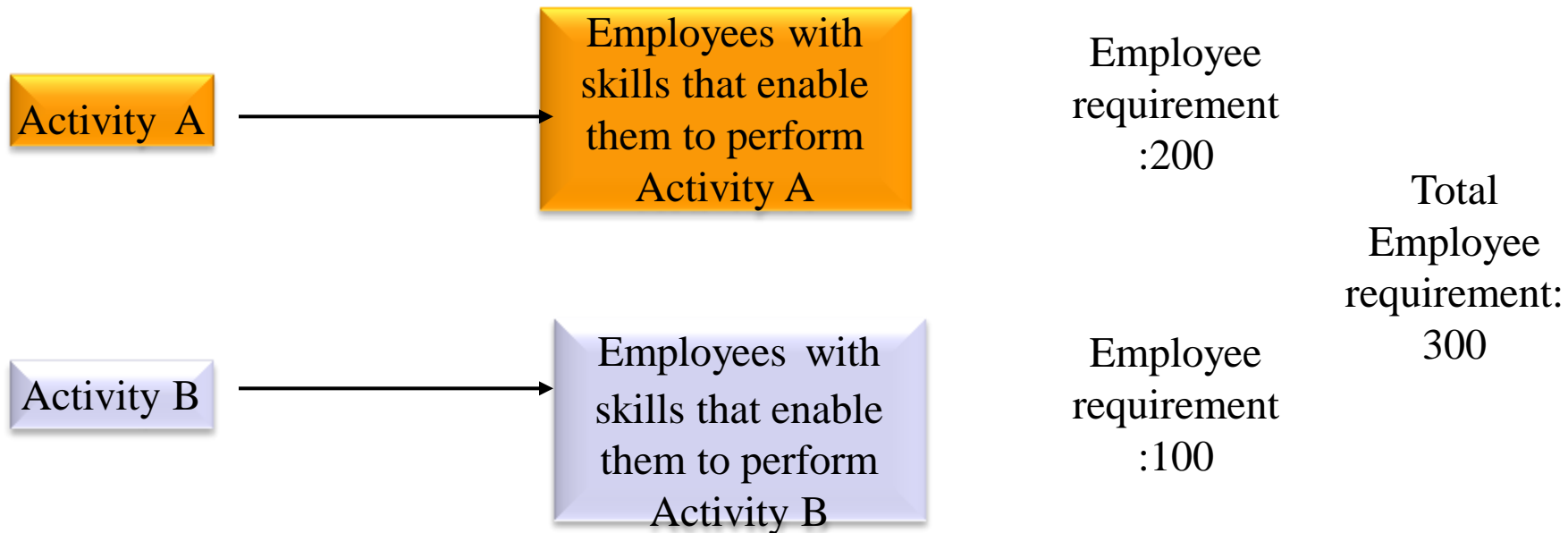
**THE CALL  
CENTER SCHOOL**

# Skills Scheduling – What is it?

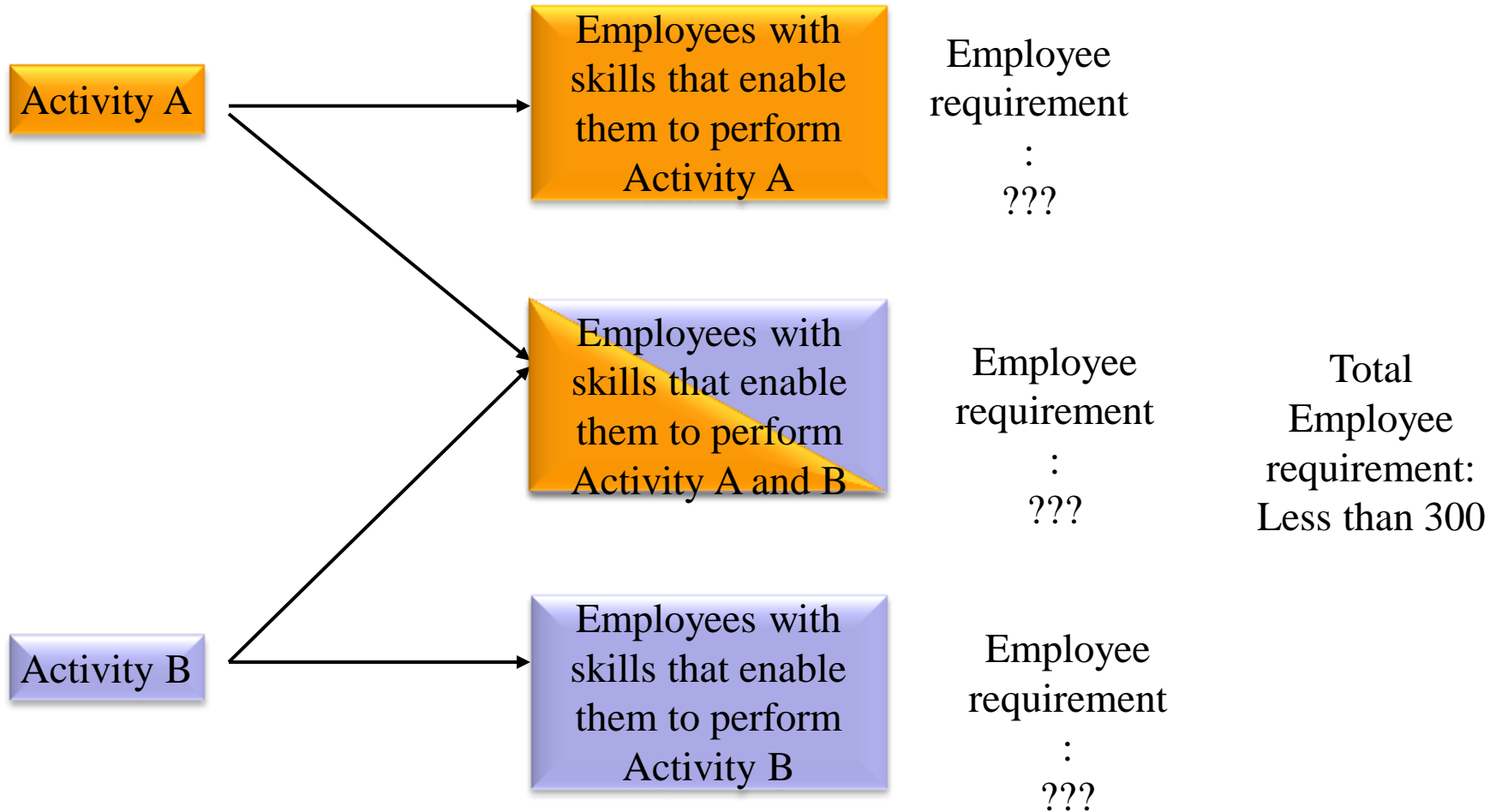
- Scheduling that takes into account the fact that employees may have one or more skills.
- When employees have more than one skill, they are less likely to remain idle, since they are able to perform more than one activity.
- This leads to:
  - Increased employee productivity,
  - Reduced employee idle time,
  - Greater employee efficiency,
  - Better service for customers.



# Example: Single-Skilled Employees



# Example: Multi skilled employees



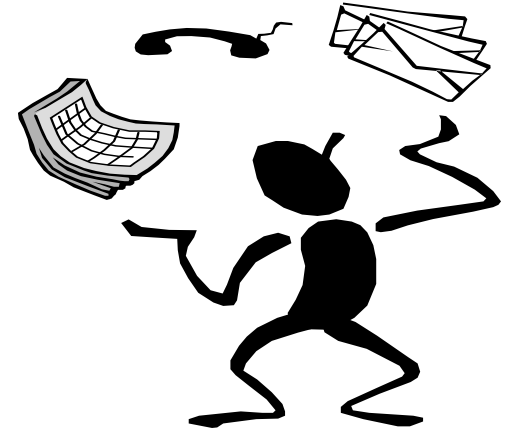
# Multi-Skilling Benefits



- It achieves “pooling efficiency”.
- This impacts positively on customer service KPIs and/or operating costs.
- Step-by-step training possible for new hires.
- Additional job variety is motivating for employees.
- Skills-based-routing functionality is provided by ACD vendors in order to provide pooling efficiency – but without skills-based scheduling the efficiency gains are hard to achieve.

# Multi-Skilling Challenges

- Dealing with staff reluctance
- Training in different contact types
- Escalating complex calls
- Increased call transfers
- Changes to IVR and/or website
- The multi-lingual dimension
- Mixing inbound and outbound calls, emails and web chat
- Forecasting and scheduling with a multi-skilled workforce
- Others?



# Skill Deployment - Variants

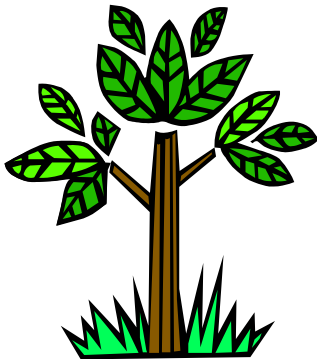


- Single skill
  - Each employee is dedicated to a single queue.
  - Staffing requirement calculation is simple (Erlang C).
  - 0% pooling efficiencies.
- Fully multi-skill
  - Each employee is capable of handling all activities.
  - Staffing requirement calculation is simple (Erlang C).
  - 100% pooling efficiencies.

# Skill Deployment - Variants

## Partial multi-skill (most common configuration)

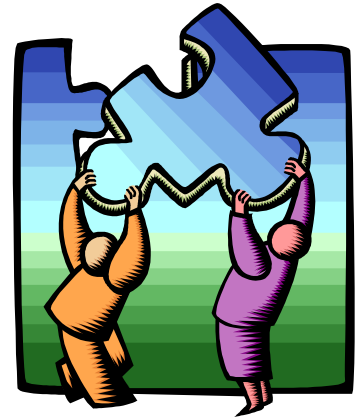
- Each employee has one or more skills and can therefore serve one or more queues / activities.
- Employees have different degrees of proficiency.
- Calculation of staffing requirement is complex:
  - Number of employees required at a point in time depends on the skill-set of the employees present at that time.
  - But skill-sets available is not known until the employees are scheduled (and log in).
  - This is a circular problem – not soluble using formulas.



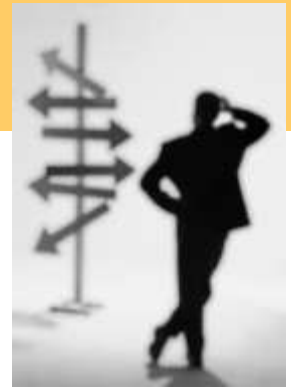


# How Much Precision Do You Need?

- Long-term plan includes:
  - Hiring plan
  - Fixed rotations for 1, 3, 6 months or more
  - Shrinkage assumption across all skills
- Short-term plan includes:
  - Known coaching, holidays, training, etc.
  - Known variances in workload and staffing
  - Known changes in ACD routing plan
- Intraday plan must accommodate:
  - Forecasting error (5-20% by half-hour)
  - Unknown shrinkage (5-15%) for absence, non-adherence etc. by skill



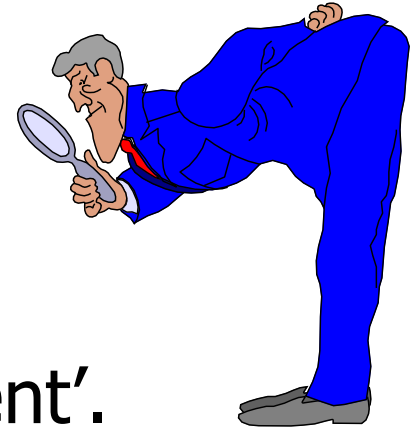
# Possible Solution 1: Adjustment factor



- Use Erlang C to calculate the staffing requirement for each work type.
- Reduce this requirement by a percentage (e.g. 10%) to represent the pooling efficiency.
- Advantages
  - Simple, fast
- Disadvantages
  - The adjustment factor is really a guess and likely to be inaccurate.
  - Adjustment factor is static but variation is not.

# Possible Solution 2: Simulation

- Generates schedules by simulating:
  - Call arrivals in a random fashion.
  - Call routing rules on the ACD.
  - Agent skill and availability.
- Each simulation run is an 'experiment'.
  - Shows projected service level at each time interval.
  - After each run, an algorithm adjusts the schedules to try to improve coverage.
  - The simulation is then re-run.
  - This continues until a time limit is reached or no further improvement is made.
- In theory, it achieves 100% pooling efficiencies.



# Simulation: Disadvantages



- High setup and maintenance effort
  - The user needs to program into the WFM tool the rules which dictate how calls are routed to employees (e.g. ACD routing rules), so that these rules can be mimicked in the simulation.
- The simulation is invalid if the ACD routing rules or agent skill assignments are changed – needs constant maintenance.
  - In practice, many contact centres do change agent skill assignments intra-day – e.g. if the volume of one type of contact increases dramatically.

# Simulation: Disadvantages



It takes a very long time to generate the schedules.

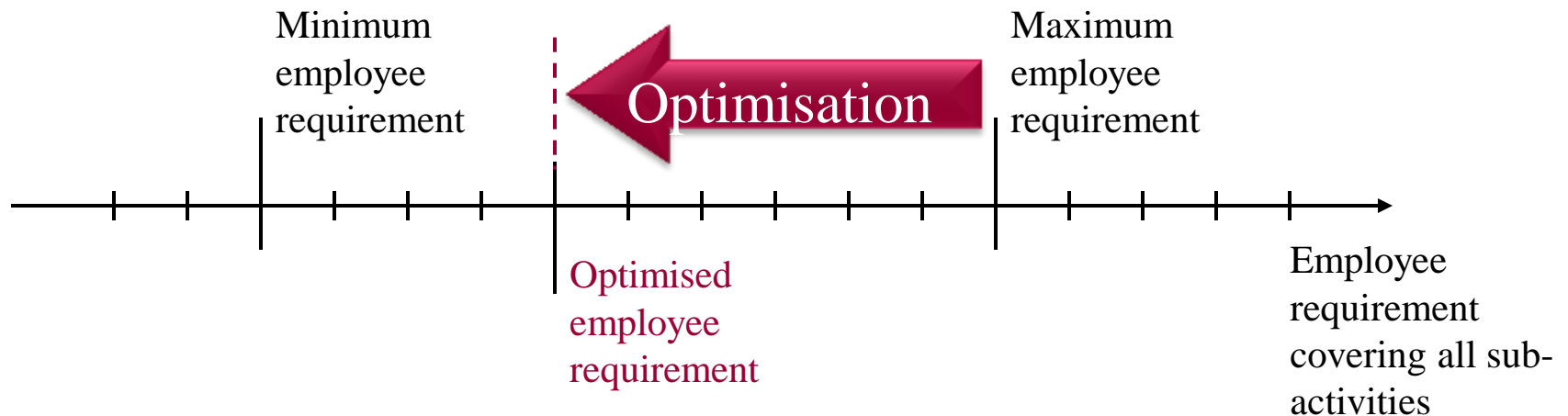
- Simulation must mimic ACD routing and handling of work.
- Essential to perform multiple simulation runs and take the average result, otherwise the 'score' for the experiment is unreliable.
- Common for users to reduce the number of replications to set a 'workable' time limit, which is insufficient to find the optimum result (therefore reducing accuracy and efficiency).
- Intraday re-simulations based on actual situation are generally impractical.

# Possible Solution #3: Optimisation

- Each activity has a projected workload including an AHT and volume for each forecast period.
  - Multiple contact types such as sales, service, support, etc.
  - Multiple media such as phone, email, chat, etc.
- Each employee has a defined set of skills.
  - Proficiency varies by contact type and medium.
  - Availability to be scheduled varies by individual.
- Each planning unit includes multiple activities and a potential set of staff.
- The objectives:
  - to optimise (minimise) the staffing requirement by utilizing multi-skilled staff
  - creating schedules that staff will actually work.

# Optimisation

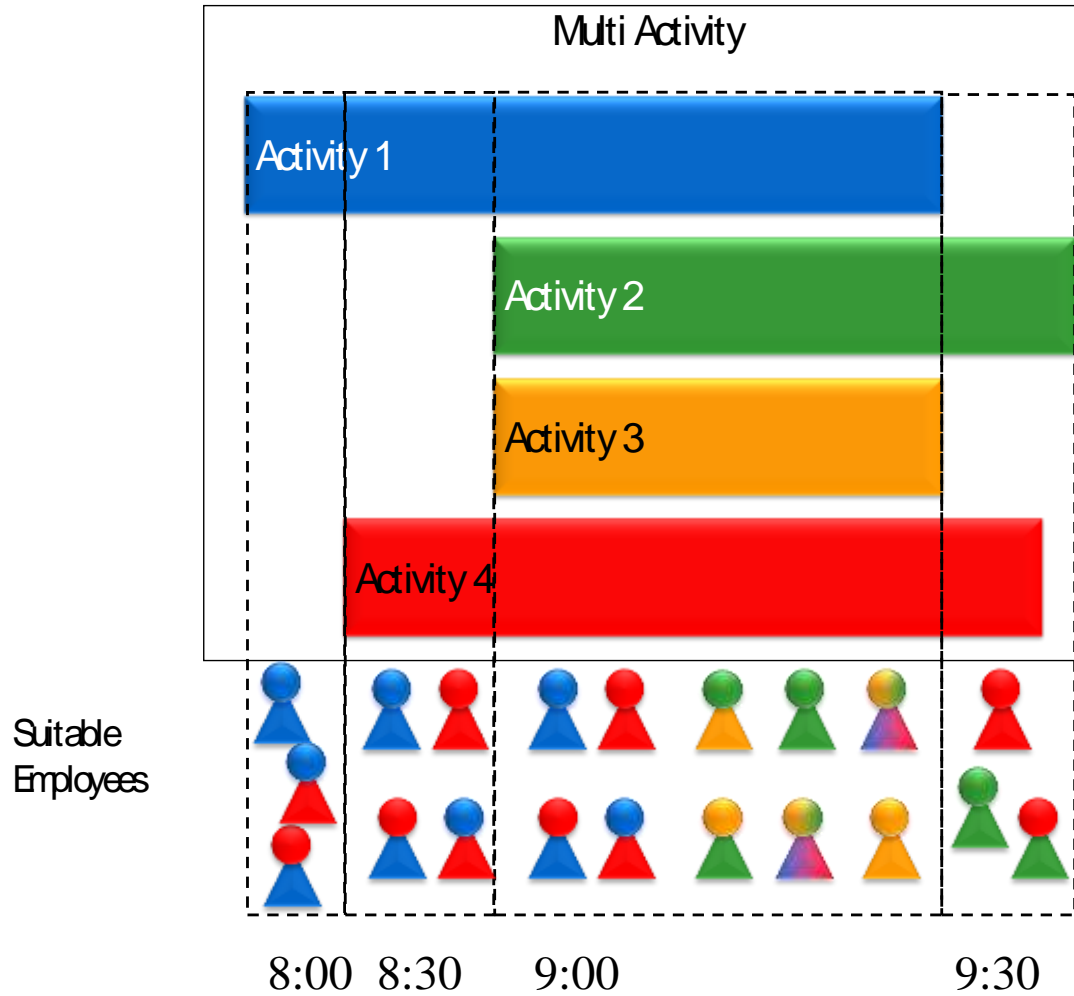
The optimised employee requirement lies between 2 limits.



***Maximum employee requirement:*** Number of employees that would be required if each employee was capable of only one activity.

***Minimum employee requirement :*** Number of employees that would be required if each employee was capable of performing all activities.

# Creating the Schedules





# Optimised Schedules



Optimisation is performed:

- One-by-one, employees are assigned to shifts within the constraints of rule-set, individual availability, etc.
- As each employee is assigned, coverage is calculated for the requirement for each sub-activity, for each 30-minute interval, taking into account:
  - the number of agents already scheduled who are capable of performing that activity.
  - the skill-level of employees – e.g. 2x50% skilled employees = 1x100% skilled employee.
- Stop when full coverage of all activities is achieved or all employees are assigned.
- Show the number of resources required per skill for separate coverage and the new requirement based on multiple skills.

# Optimisation Benefits



- Increased efficiency
  - Better utilisation of staff using all skills available
  - Resource planners can focus on more value-added efforts
- Time saved
  - No need to programme WFM system to mimic ACD routing (and maintain match as routing is adjusted)
  - Much faster processing than simulation
  - Able to meet short-term and intraday needs for adjustments
- Increased schedule accuracy
  - Avoid over-capacity – save costs
  - Avoid under-capacity – consistent achievement of targets
  - Avoid no coverage – ensure all contact types are handled