Fact Sheet – Workload Generation

Introduction

Balancing workload with the output capacity is key to optimising organisational performance and is essential for effective management control. The capacity side of the equation is covered in a separate factsheet, and this factsheet deals with workload. Although this factsheet aligns mainly to the planner's role, the building of the workload comes from many sources in the business and needs many inputs – the planner in some respects is the user of the inputs and so it makes sense for them to be the gate keeper, ensuring all inputs are valid.

Assigning task time

Whether we are loading routine or non-routine work, task time is a critical factor, how much is this job worth is the question? Put yourself in the shoes of the customer. Are you willing to subsidise the supplier because the right person is on leave and the back-up person delivers the right quality but takes twice as long? Unless you are of a particularly generous spirit, the answer will most assuredly be no. Quite reasonably, the customer expects to pay a (fair) standard price for a standard job and if they are unhappy with the price being offered, they will go elsewhere. Now, although that sort of high competition doesn't reside in many maintenance organisations it is important that we remain cost competitive – no contract is unbreakable!

But how is a standard produced in a consistent way, irrespective of who derives it? It's much more controllable in a small organisation where there may be only one person doing the estimating, however in a larger one, with multiple individuals, over an extended time period it is likely that there will be some degree of inconsistency. One answer is to develop a set of rules, document them and train individuals who are, or will be engaged in task estimation.

Chargeable task element

Consider the composition of the elements involved in performing a task and categorise whether it qualifies as being part of the direct job (i.e. chargeable, what you as a customer would see as something you would expect to pay) or as an overhead cost to the organisation (i.e. something that the customer would see as being at the organisation's cost). A few examples are shown in the following table:

Task Element	Customer Chargeable (direct)	Organisation's Overhead
Travelling time to and from job		✓
Getting parts from the stores		✓
Getting tools from tool station		✓
Setting up tools on job	✓	
Calling Engineering to resolve a discrepancy		✓
Printing off drawings		✓
Performing the direct task	✓	
Fatigue break necessary because of difficult or awkward access		✓
Performance shortfall due to task performed by staff in training		✓
Oversight/supervision of staff in training performing task		✓
Inspection of installation	✓	
Function check	✓	
Clean up post job complete (vehicle)	✓	
Clear tools away		✓
Return tooling to tool station		✓

This is not an exhaustive list and there may be other activities that need to be added to it and decisions should similarly be made as to whether the cost is chargeable or is to be absorbed by the organisation. Whilst the 'checked' boxes have been offered here, there is no reason why an organisation might decide to make an item chargeable to the customer and it is for the organisation to decide their approach. The watchword here is consistency, however it is important to bear in mind the competitive nature of the marketplace!

Now, there is a reasonable argument that everything is in fact chargeable; travelling time as an example costs the organisation money and somehow that is to be recharged. The customer, quite rightly, won't pay directly for them, but the wise organisation recharges them through billing in various manner. The key element to understand is that even the overheads need to be controlled as they are a cost. To overcome this in developing consistent task times the following table and approach should be adopted:

Task: inspecting and replacing brake pads	**Fixed Provision**	**Travelling time**	**Chargeable Labour**	**Allowance (expected losses)**
Travelling time to and from job		:10		
Getting parts from the stores				:10
Getting tools from tool station	:02			
Setting up tools on job			:01	

Calling Engineering to resolve a discrepancy				:05
Printing off drawings	:03			
Performing the direct task			1:05	
Fatigue break necessary because of difficult or awkward access	:15			
Performance shortfall due to task performed by staff in training				:12
Oversight/supervision of staff in training performing task	:10			
Inspection of installation			:05	
Function check			:20	
Clean up post job complete (vehicle)			:05	
Clear tools away	:03			
Return tooling to tool station	:02			
	0:35	0:10	1:36	0:27

In the above example you can see that there is only 1:36 mins (directly) chargeable to the customer, but the organisation must absorb non-chargeable costs of 1:12 mins. Additionally, the task cannot be completed in the direct chargeable time, so planning for only that time will effectively be planning to fail. The time (at present) that needs to be planned to that task is 2:48 to ensure there is adequate time for quality.

I say 'at present' as it is worth considering, how can those elements of accomplishing a given task that are designated as being overheads be reduced? Whilst there are some that are clearly unavoidable, there are others that can be addressed by alternative ways of working. For instance, getting materials and tooling delivered to the work location by support (or indirect) staff, a quantity of travelling time for the member of the production team is removed, theoretically releasing additional productive time to the respective person, thereby increasing productive opportunities and improving productivity. In short, can a less expensive indirect resource cost effectively support their colleague in Production?

Conversely, the direct elements of the task can in theory only be reduced by changing the way the task is done, through the introduction of a better way of achieving the task (new technology, improved tooling, task design).

Another point that arises in considering what should be included in task times is contingency for when a task develops complications e.g. a fastener is found to be difficult to remove. Once again, taking a customer's perspective, they'd probably have an issue with being charged for something that might not apply. The additional work required because of such a complication, should it arise, is certainly direct

work and therefore needs to be captured and charged accordingly should it be encountered. Transparency of what has occurred is the best approach and this is gained through raising documentation to cover the additional work that is necessary (i.e. a defect order).

Once decisions have been agreed on the various elements of task accomplishment it is essential that they are documented and furthermore should feature in relating training and refresher training material.

A note on productivity measurement and bookings

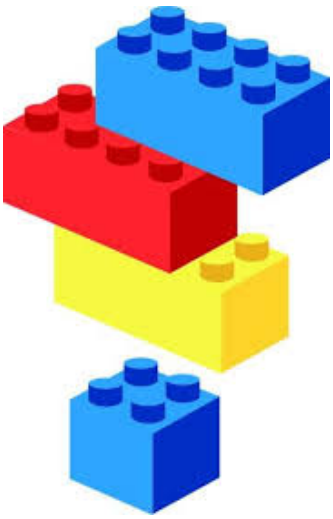
You'll see in the factsheet on Productivity that we advocate collecting productivity at the 'chargeable' data stage. In the above example, this means that the person undertaking the task, even if they complete it on time will only achieve 57% output productivity. (1:36/2:48)*100%.

This sounds harsh and many advocates that one should consider the time taken, often collected in a booking to the job. This masks the natural inefficiencies in the task and there is a fact that when people read 100% they seek no further improvement……. Whereas in fact there is stacks of improvement to be made.

57% productivity is a measure of the profit you'll make – get the cost down, this rises! That in a nutshell is why we always advocate productivity measures are taken against the billable element only.

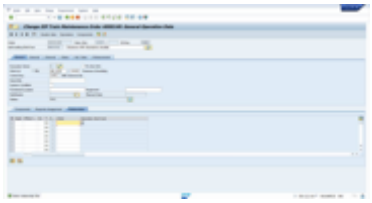
Task Synthesis

Sub tasks used as building blocks for the desired task.



Having established the principles by which standards are derived, the objective of consistency is further supported through a process of assembling new, or as yet unengineered, tasks utilising common task ingredients and applying their respective standards. These task ingredients can range from the removal of a fastener to the removal, fitment and function of a component. The use of such building blocks not only helps with consistency it can also speed up the process of creating a new task that contains well-understood elements.

The SAP system has the facility to pull in such common tasks into a revision when it is generated by means of what is termed a parent/child relationship. The parent order 'pulls into' the revision all the associated linked orders (children) at the point of workpack generation, inclusive of required resources to perform the task (people, materials, tooling, equipment etc.) as defined on the respective linked orders and furthermore can include or exclude orders that are TMC and/or configuration specific. Clearly this relies completely on the data integrity being solid, the links between data being accurate and all of this being maintained as and when things change.



Generates

Parent task

Subordinate task list (children)

It is of course possible to build tasks individually, however there is a danger that this approach can easily lead to inconsistencies because in this situation there is a tendency for the task to be built in isolation. Another advantage in utilising common tasks is that they are repeatedly visited, and their validity is constantly reviewed as a consequence.

If the whole exam is constructed of tasks built in this way, the task of matching the load with available productive output capacity (i.e. meeting the target of production's utilisation at 100%) can be done by a standard process consistently. But what about defects? How are these to be managed and loaded consistently such that they form an achievable part of the proposed work package?

Defects (non-routine work)

If you haven't already, read the factsheet on non-routine work. The concept of using the building block approach can equally be applied to defects or non-routine work where there are very often routine tasks that can be utilised to cover access and restoration elements required in the course of working the defect. Also, strong consideration should be given to the development and use a defect-database on SAP for regularly occurring defects. Furthermore, it can be organised to contain staged troubleshooting information that is supportive of a consistent approach to diagnostics within production. This can cover inbound defects but what about defects that arise through the course of the check?

It is worth examining historical data to form a better idea of what might be expected. Is there a correlation between the exam called and the numbers of hours of defect arisings? What about seasonality, is this a factor? How about the quantity of defects (level 3, 4 and 5) that the train is carrying? Is that providing a 'tell' as to the general health of the train and what might be expected when it comes into work? How about its last exam, how did that go? Is the trains in service reliability providing some clues? Analysis of this type of information helps to develop a more scientific approach and should feature in a review process such that what emerge as relevant factors are more closely studied. A figure for this type of work should be added to the overall load such that a bottom-line figure is produced to balance against the planned productive output capacity.

Feedback

This is invaluable in the learning and improvement process. Discrepancies between what was planned and what happened in practice need to be understood. Was it a bad task estimate or were there some external circumstances which hindered the task? The Plan-led cycle incorporates a weekly formal review of inputs and will provide high-level information covering departmental performance, however a good line of communication between the production staff involved is hugely advantageous.

When there is a greater accountability for meeting the planned task time, very soon information regarding task times that are too ambitious, will be forthcoming from the production team. Similarly, there will be times that are too generous; generally, these are not quite so willingly put forward.

Devoting time to examining what happened against what was planned is time well spent and adds value to the cycle of continuous improvement.

Summary

Maximising the containable load going through the business will yield the highest levels of productivity and hence profit. It follows then that all the load data being used needs to be accurate if the dual aspirations of delivering high productivity and providing value for money to the customer are to be realised.

Having a well-defined methodology for developing the workload associated with all tasks will lead to consistency and accuracy in estimates. This discipline, coupled with good lines of communication between the production team and the support team, both formal and informal, will ensure that resources are utilised efficiently.