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| **Kingdom of Saudi Arabia**  **Ministry of Education**  **Saudi Electronic University** | A picture containing text, outdoor, sign  Description automatically generated | **المملكة العربية السعودية**  **وزارة التعليم**  **الجامعة السعودية الإلكترونية** |

**College of Administrative and Financial Sciences**

**Assignment 2**

**Introduction to Operations Management (MGT 311)**

**Due Date: 02/11/2024 @ 23:59**

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| Course Name: **Introduction to Operations Management** | Student’s Name: |
| Course Code: **MGT 311** | Student’s ID Number: |
| Semester: **First** | CRN: |
| Academic Year:**2024-25-1st** | |
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**For Instructor’s Use only**

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| Instructor’s Name: | |
| Students’ Grade:  Marks Obtained/**Out of 10** | Level of Marks: High/Middle/Low |

**General Instructions – PLEASE READ THEM CAREFULLY**

* The Assignment must be submitted on Blackboard (**WORD format only**) via allocated folder.
* Assignments submitted through email will not be accepted.
* Students are advised to make their work clear and well presented, marks may be reduced for poor presentation. This includes filling your information on the cover page.
* Students must mention question number clearly in their answer.
* Late submission will NOT be accepted.
* Avoid plagiarism, the work should be in your own words, copying from students or other resources without proper referencing will result in ZERO marks. No exceptions.
* All answered must be typed using **Times New Roman (size 12, double-spaced)** font. No pictures containing text will be accepted and will be considered plagiarism).
* Submissions without this cover page will NOT be accepted.

**Learning Outcomes:**

* To designing profitable services that provide high level of quality to satisfy business needs.
* To ensure that the services delivered are reasonable and relevant to the customers.
* To gain an understanding of the business rules and ensure if the results are in alignment with the organizational goals.

**Go through the given case scenario**

‘There must be a better way of running this place!’ said Dean Hammond, recently recruited General Manager of Boys and Boden, as he finished a somewhat stressful conversation with a complaining customer, a large and loyal local building contractor.

‘We had six weeks to make their special staircase, and we are still late! I’ll have to persuade one of the joiners to work overtime this weekend to get everything ready for Monday. We never seem to get complaints about quality, as our men always do an excellent job … but there is usually a big backlog of work, and something always gets finished late, so how should we set priorities? We could do the most profitable work first, or the work for our biggest customers, or the jobs which are most behind on. In practice, we try to satisfy everyone as best we can, but inevitably someone’s order will be late. In theory, each job should be quite profitable, since we build into the price a big allowance for waste, and for timber defects. And we know the work content of almost any task we would have to do; this is the basis of our estimating system. But, overall, the department is disappointingly unprofitable, and most problems seem to end up with a higher-than-anticipated cost, and with late deliveries!’

Boys and Boden was a small, successful, privately-owned timber and building materials merchant based in a small town. Over the years it had established a large Joinery Department, which made doors, windows, staircases and other timber products, all to the exact special requirements of the customers, mostly comprising numerous local and regional builders. In addition, the joiners would cut and prepare special orders of timber, such as non-standard sections and special profiles, including old designs of skirting board, sometimes at very short notice, and often even while the customers waited. Typically, for larger joinery items, the customer provided simple dimensioned sketches of the required products. These were then passed to the central Estimating and Quotations Department which, in conjunction with the Joinery Manager, calculated costs and prepared a written quotation, which was faxed or posted to the customer. This first stage was normally completed within two or three days, but on occasions could take a week or more. On receipt of an order, the original sketches and estimating details were passed back to the Joinery Manager, who roughly scheduled them into his manufacturing plan, allocating them to individual craftsmen as each became available. Most of the joiners were capable of making any product, and enjoyed the wide variety of challenging work.

The Joinery Department appeared congested and somewhat untidy, but everyone believed that this was acceptable and normal for job shops, since there was no single flow route for materials. Whatever the design of the item being made, it was normal for the joiner to select the required bulk timber from the storage building across the yard. This roughly-sawn timber was then prepared using a planer-thicknesser machine which gave it smooth, parallel surfaces. After that, the joiners would use a variety of processes, depending on product. The timber could be machined into different cross-sectional shapes, cut into component lengths using a radial arm saw, joints were formed by hand tools, or using a morticing machine, and so on. Finally, the products would be glued and assembled with screws and nails, sanded smooth by hand or by machine, and treated with preservatives, stains or varnishes if required. All the large and more expensive floor-standing machines were grouped together by type (for example, saws) or were single pieces of equipment shared by all 10 joiners. Every joiner also owned a complete set of hand tools which they guarded and cared for with pride. Dean described what one might observe on a random visit to the Joinery Department:

‘One or two long staircases partly assembled, and crossing several work areas; large door frames on trestles being assembled; stacks of window components for a large contract being prepared and jointed, and so on. Offcuts and wood shavings are scattered around the work area, but are periodically cleared when they get in the way or form a hazard. The joiners try to fit in with each other over the use of machinery, so are often working on several, part-finished items at once. Varnishing or staining has to be done when it’s quiet, for example towards the end of the working day or at weekends, or even outside, to avoid sawdust contamination. Long offcuts are stacked around the workshop, to be used up on any future occasion when these lengths or sections are required. However, it is often easier to take a new length of timber for each job, so the offcuts do tend to build up over time. Unfortunately, everything I have described is getting worse as we get busier … our sales are increasing so the system is getting more congested. The joiners are almost climbing over each other to complete their work. Unfortunately, despite having more orders, the department has remained stubbornly unprofitable!

’Whilst analysing in detail the lack of profit, we were horrified to find that, for the majority of orders, the actual times booked by the joiners exceeded the estimated times by up to 50 per cent. Sometimes this was clearly attributable to the inexperience of newly employed joiners. Although fully trained and qualified, they might lack the experience needed to complete a complex job in the time an Estimator would expect; but there had been no feedback of this to the individual. We then put one of these men on doors only; having overcome his initial reluctance, he has become an enthusiastic “door expert” and gets closely involved in quotations too, so now he always does his work within the time estimates! However, the main time losses were found to be the result of general delays caused by congestion, interference, double-handling, and rework to rectify in-process damage. Moreover, we found that a joiner walked an average of nearly 5 km a day, usually carrying around heavy bits of wood.

‘When I did my operations management course on my MBA, the professor described the application of cellular manufacturing and JIT. From what I can remember, the idea seems to be to get better flow, reducing the times and distances in the process, and thus achieving quicker throughput times. That is just what we needed, but these concepts were explained in the context of high-volume, repetitive production of bicycles, whereas all the products we make are one-offs. However, although we do make a lot of different staircases, they all use roughly the same process steps:

1 Cutting timber to width and length

2 Sanding

3 Machining

4 Tenoning

5 Manual assembly (glue and wedges)

‘We have a lot of unused factory floor space, so it would be relatively easy to set up a self-contained staircase cell. There is a huge demand for specially-made stairs in this region, but also a lot of competing small joinery businesses with low overheads, which can beat us on price and lead-time. So we go to a lot of trouble quoting for stairs, but only win about 20 per cent of the business. If we could get the cell idea to work, we should be more competitive on price and delivery, hence winning more orders. At least that is the theory. I know we will need a lot more volume to justify establishing the cell, so it’s really a case of whether to construct a cell in anticipation of higher demand, or to try to win more business first. To do the latter, we would have to reduce our selling prices and lead-times, and then allocate more joiners to complete the higher volumes of orders until we had enough work to set up the cell. I personally favour setting up the cell first so that we can have a “capacity leads demand” strategy.’

**Questions**

1. To what extent could (or should) Dean expect to apply the philosophies and techniques of JIT to the running of the staircase cell**? (2.5 MM)**

2. What are likely to be the main categories of costs and benefits in establishing the cell? Are there any non-financial benefits which should be taken into account? **(2.5 MM)**

3.How different would the cell work (job design) be to that in the main Joinery Department? **(2.5 MM)**

4. What risks are associated with Dean’s proposal?

**(2.5 MM)**

**Note:**

* **You must include at least 5 references.**
* **Format your references using APA style.**
* **Each answer must not be less than 300 words**

**Answers**

1. **Answer-**
2. **Answer-**
3. **Answer-**
4. **Answer-**