Functional Understanding of Tapeline planning and scheduling

* All the below points are based on shared rules.

Tape Demand :

1. **Conversion of total fabric meter to warp, warp\_rf, weft into KG**
2. Takeout freezed plan of Weaving (datewise, shiftwise, loomswise, fabricwise, planned quantity)
3. Take tape specifications data from DB table fabric recipe, master fabric recipe, master tape data and other tables.
4. Filter the weaving planning data according to configured demand days like 1,2,3 days demand.
   1. For the running fabrics take the fabric balance to make as min(fabric balance to make, production\_capacity per day\*configured\_days)
   2. For upcoming changeovers, take the weaving planning data where there is changeover in n days(n=configured\_days).
5. As the weaving quantity is in meters. That neds to be converted in Kg.
   1. 1. Get required parameters from fabricRecipe, master\_tape(fabricwidth, gsm, warpmesh, weftmesh, tape denier)
   2. 2. Fabric in KG = (Width\*fabric\_quantity(meter)\*gsm)/1000
6. Now to convert total kg requirement into warp tape,warp rf tape and weft tape
   1. Warp tape = Fabric in KG \* Warp%/100
   2. Warp rf tape = Fabric in KG \* Warp rf %/100
   3. Weft tape = Fabric in KG \* Weft%/100
7. This warp tape, warp rf and weft tape is total demand of that fabric’s planned quantity on a loom.
8. **Loading/Unloading :**
9. Loading/unloading will happen in only warp and warp rf tapes
10. If there is a change in warp id of current and previous production then:
    1. Warp load = warp tapes\*1.5\*warp layers
    2. Warp unload = warp tapes\*0.6\*warp layers
    3. Previous warp unload = previous warp tapes \* 0.6\* previous warp layers
11. If there is no change current warp id and prev warp id then:
    1. If current warp tapes> prev warp tapes:
       1. Warp load = (current warp tapes - prev warp tapes)\*1.5\*current warp layers
       2. Warp unload = current warp layers\*0.6\*current warp layers
       3. Prev warp unload = 0
    2. If current warp tapes < pre warp tapes;
       1. Warp load = 0
       2. Warp unload = current warp tapes\*0.6\*current warp layers
       3. Prev warp unload = (prev warp tapes - current warp tapes)\*prev warp layers
    3. If there is no change in ids:
       1. Warp load =0
       2. Warp unload = 0
       3. Prev warp unload = prev warp layers \* 0.6 \* prev warp layers
12. Same for warp rf tapes
13. After loading unloading:
    1. Total warp demand = warp tape + warp load
    2. Total weft demand = weft tape
    3. Total warp rf demand = warp rf tape + warp rf load
14. **Inventory management :**
15. We will be using unit wise current available inventory
16. At the time of unloading, we will be adding unload tapes into inventory
17. **Tape Completion Date :**
18. Weaving Changeover start date – 1 day will be tape completion date.
19. **Buffer demand :**

1. Along with the demand from weaving planning, there is also some amount of demand directly from the buffer demand data.

Tape demand scheduling

1. Tape Production data
   1. Tape production data is taken to get the production velocity of each machine based on tape specification.(Data from 2023 onwards)
   2. Production data is filtered according to the min max threshold of production in kgs/hr of each machine
   3. Mean of production per hour per machine is taken as production velocity which will be used in calculating production time.
   4. Last production data of each machine is extracted
2. Best machine assignment
   1. Best machines are assigned to each tape id based on tape specification constraint rules of denier, width, filler , RP according to machines
   2. Then the velocity of best assigned machines based on tape specs is taken from the production velocity and the final best machine is assigned according to the max load a machine can produce.
   3. If a certain tape spec velocity is not found from production velocity data then , velocity for this tape spec is fetched from the design capacity data of machines.
   4. If no matching machine is found for a tape then it is not scheduled.
3. Tape Scheduler
   1. The schedule with the best machine assigned is processed for calculating production start and end time considering the changeovers between the production and the planned stop of machines
   2. First the production start time is taken as the machine availability time after the last production:
   3. Width changeover:
      1. If current tape width != prev width on machine, then there is width changeover
      2. Width change end time = start time + width change time
   4. Recipe changeover:
      1. Recipe change end time = start time +recipe change time
      2. Recipe change time is taken from the configured recipe change rule data
   5. Denier Change over
      1. denier change end time = start time +denier change time
      2. Denier change time is taken from the configured denier change rule data
   6. Considering width change ,recipe change and denier change time
      1. If there is width changeover then change over taken as width change only, start time is taken as width change end time.
      2. If there is recipe change then the start time is taken as the recipe change end time
      3. If there is no recipe change , then if there is denier change then, start time is taken as denier change end time
   7. If the current production on machine lies between the planned stop duration of that machine then production is shifted after the planned stop time.
   8. After considering all the change overs, Then the production end time = start time + time taken
      1. Where time taken = total demand (kg)/ machine velocity (kg/hrs)
   9. Based on above consideration of changeover the final production time is calculated and final tape schedule is generated.