

PRESENTATION WAS OBSERVED BY 3020
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Presentation

by Ashleigh Francis

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CONTACTLESS SENSING USING LABVIEW

ASHLEIGH FRANCIS

PROJECT BACKGROUND

- WITHIN INDUSTRY COMPONENTS THAT ARE PRODUCED BY A COMPANY WILL NEED TO MEET SPECIFIC REQUIREMENTS.
- MECHANICAL COMPONENTS SUCH AS BRACKETS OR CAR PARTS ARE PRODUCED AND NEED TO MEET ACCURATE SPECIFICATION.
- CONTACTLESS SENSING CAN BE USED TO ACCURATELY MEASURE COMPONENT SIZE , DRILL HOLE SIZES, LOCATIONS AND POSITIONS.
- THE USE OF CONTACTLESS SENSING CAN HELP WITH PRODUCTION SPEED, ACCURACY AND ALSO HELP PREVENT MAINTENANCE.

PROJECT DEFINITION

AIMS AND OBJECTIVES

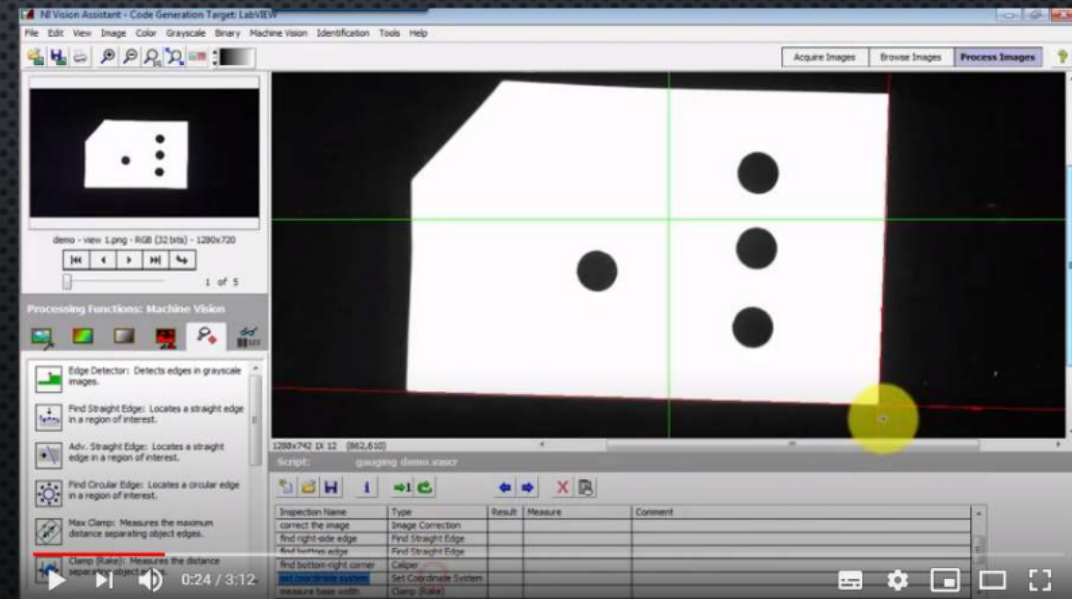
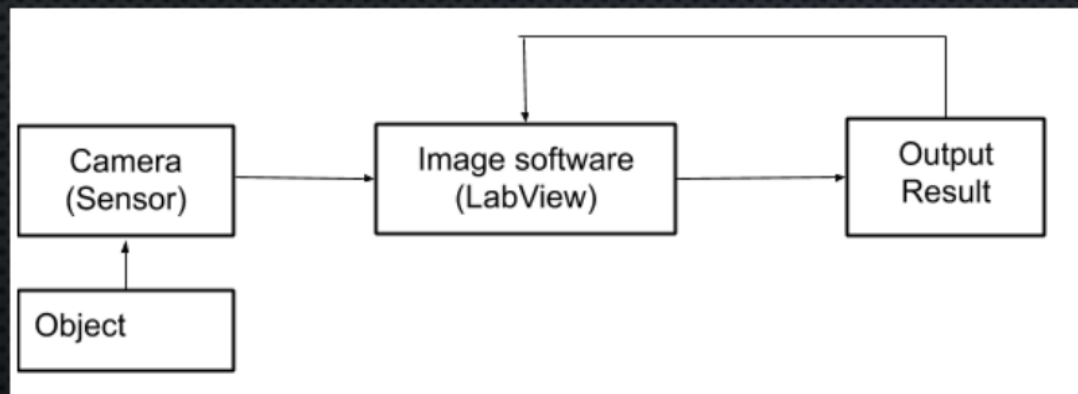
- TO DETECT THE PARAMETERS OF A MECHANICAL COMPONENTS THAT HAS BEEN PRODUCED BY A PRODUCTION LINE
- TO ENSURE THAT ALL NECESSARY REQUIREMENTS FOR THAT COMPONENT SUCH AS COMPONENTS SIZE AND DRILL HOLE LOCATIONS AND SIZES HAVE BEEN MET.
- IF ANY INCORRECT MEASUREMENTS ARE FOUND THE COMPONENT WILL THEN BE REJECTED.
- THIS WILL PREVENT ANY INACCURATE COMPONENTS FROM BEING PRODUCED OR ACCEPTED.

FUNCTIONAL DESIGN

WHAT WILL THE PROJECT DO?

1. WEB CAMERA WILL TAKE AN IMAGE OF COMPONENT
2. CREATE REGIONS OF INTEREST (ROI)
3. CREATE CHARACTERISTIC MEASUREMENTS SUCH AS DRILL HOLES, EDGES AND SIZE.
4. COMPARE MEASUREMENTS WITH GOOD SPEC.
5. PRODUCE A PASS OR FAIL OUTPUT TO SYSTEM.

Block Diagram





Whilst creating this project there is always the risk of the possibility of the LabVIEW software being used not working or even not being accessible.



If this was to happen then an alternative method would be required to be used.



An alternative method for completing this method would be to use a smart camera, PLC and a Siemens program.

PROJECT RISKS

METHODS

Solution 1 (LabVIEW with Web Camera)

Lab view software will be linked with a standard web camera to measure and detect exact measurements and parameters of a mechanical component.

There are a number of different applications that can be used within LabVIEW, the ones that can be used for this project will be:

- LabVIEW Machine Vision – This has all the individual components for developing a vision system
- Vision Assistant – More complex application used for image analysing and processing.
- IMAQ dx – This consists of the driver packages for vision sensor e.g Web Camera



Cost = LabView £2000 Webcam £50

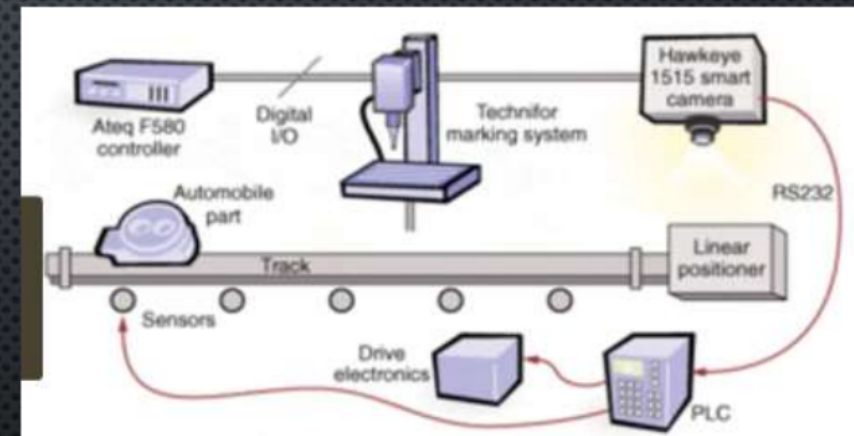
METHODS

Solution 2 (PLC , Smart Camera and Siemens program)

THIS METHOD REQUIRE THE USE OF A SMART CAMERA OF CHOICE CONNECTED TO A PLC AND A SIEMENS PROGRAM CREATED.

- THE SMART CAMERA WOULD BE USED TO DETECT THE COMPONENT AND COLLECT AN IMAGE AND MEASUREMENTS
- ONCE AND IMAGE AND MEASUREMENTS HAVE BEEN COLLECTED BY THE CAMERA THE RESULT WOULD BE FED BACK TO A PLC THAT WILL HAVE A SIEMENS PROGRAM PRODUCED FOR IT.
- DEPENDANT ON THE PROGRAM AND THE RESULT PRODUCED BY THE CAMERA A PASS OR FAIL RESULT WILL BE PRESENTED ON A HMI.

Cost = Smart Camera £4000 PLC £2000



CRITICAL CHOICE

SOLUTION 1 (LABVIEW WITH WEB CAMERA)

PROS

- COST EFFECTIVE
- PHYSICALLY SMALL IN SIZE

CONS

- NOT EXPANDABLE

COST

£2050

SOLUTION 2 (PLC , SMART CAMERA AND SIEMENS PROGRAM)

PROS

- EXPANDABLE

CONS

- MORE EXPENSIVE
- MORE COMPLEX SOFTWARE REQUIRED
- PHYSICALLY BIGGER IN SIZE

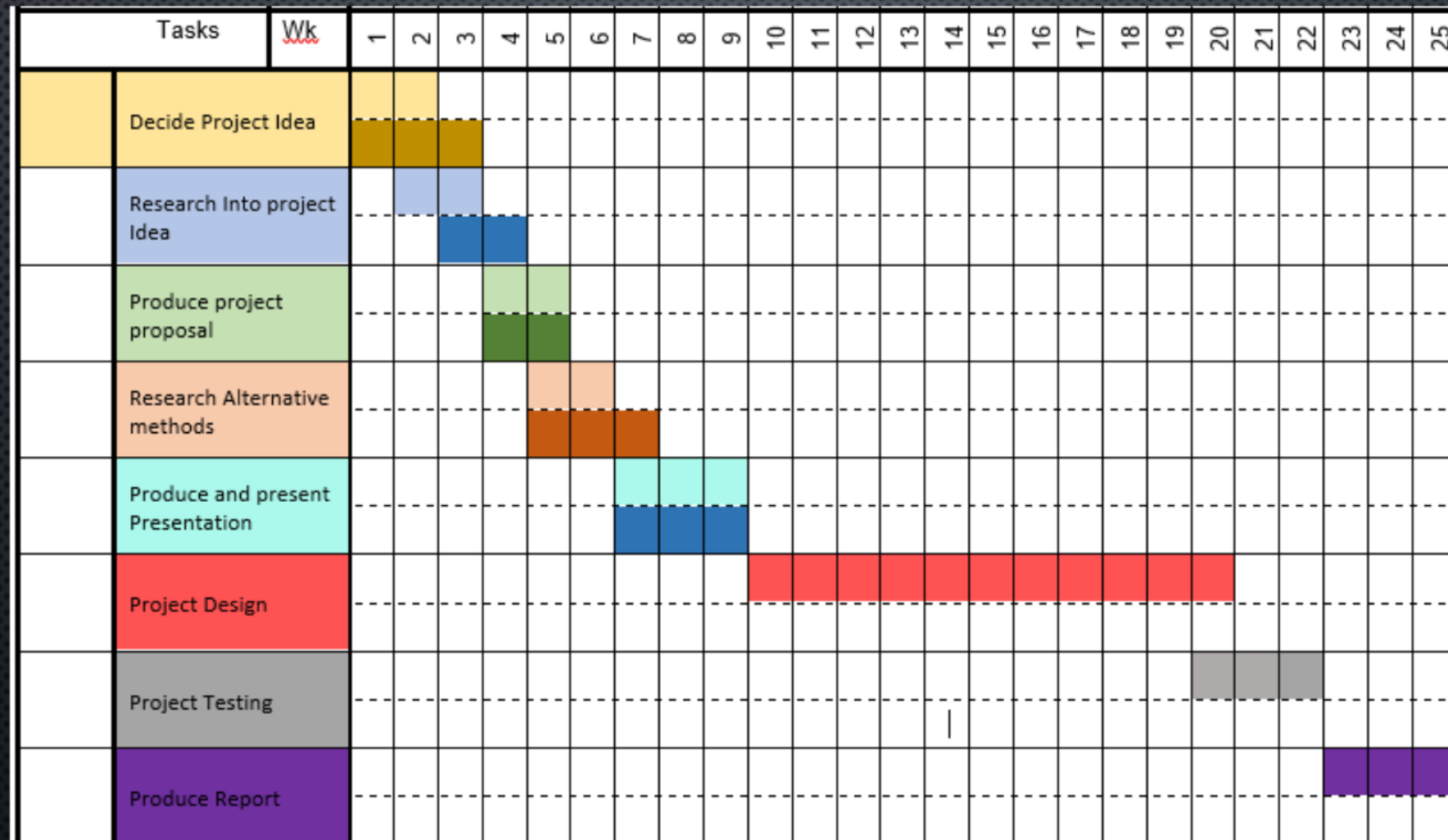
COST

£6000



Final Decision : Solution 1 (LabVIEW with Web Camera)

GANTT CHART



THANKYOU FOR LISTENING !

Any Questions ?

Presentation

GRADEMARK REPORT

FINAL GRADE

GENERAL COMMENTS

75/100

Instructor

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GRADING FORM: CSG-RUBIC

ASHLEIGH FRANCIS

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RESEARCH-INFORMED LITERATURE

 Reasonable project background and explained the theme very well. 7/10 Good evidence of research including the software plugin components critical to the project. 7/10

14/20

KNOWLEDGE AND UNDERSTANDING

 Project purpose was explained clearly and examples from industry included in the explanations. 4/5 Project constraints and risks were discussed and action plan in place. Codes of practice and standards were explained for the project including intellectual property law. 3.5/5 Environmental and sustainability issues were explained in the questioning section and the benefits of the project with these issues. 4/5 Functional design was good. 4/5 Response to questioning was very good and demonstrated the research element. 8.5/10

24/30

ANALYSIS

 Problem was clearly defined and linked with example from industry. 4/5 Functional design specification was clear. and explained very well. 7.5/10 A good argument given for the choice of final

15/20

solution. 3.5/5

PRACTICAL APPLICATION AND DEP.

 Design spec included enough detail and an example which was explained very clearly and aided with a block diagram. 3.5/5 Argument for critical choice of final solution was very good with plenty of details given in the explanation. 8/10 Project plan included a work breakdown of criteria for the project. 3.5/5

15/20

SKILLS FOR PROFESSIONAL PRAC.

 Slides contained good relevant information resulting from research. 3/5 Overall delivery was very good with attention to detail. 4/5

7/10