

LEVEL 6 SPECIFICATION ASSESSMENT

Student Name:		Student ID Number:	
Programme:	Innovation and Product Development for Industry 4.0		
Module code:	ACPA 6000	Contribution to Overall Assessment (%):	100%
Lecturer:	Alan Mumby	Internal Verifier:	Graham Howe
Assignment title	Management of NPD Assessment Creating the Design Brief	Word Count:	4,500
Submission deadline:	12 noon, 30 th September 2022	Return date of provisional marks and written feedback:	TBC
Submission Method:	All written assessments, where practical and possible, must be submitted via Turnitin unless otherwise instructed by the Lecturer. (Please DO NOT put this assessment specification into Turnitin or it will match many similarities with other students' submissions.) Alternative submission method (if applicable): Late submission of the assessment will result in a late penalty mark. Penalties for late submission: Up to one week late, maximum mark of 50%. Over one week late, 0%. Only the Extenuating Circumstances Panel may approve a change to submission dates.		
Academic honesty/referencing:	Academic honesty is required. In the main body of your submission you must give credit to authors on whose research and ideas your work is based. Append to your submission a reference list that indicates the books, articles, etc. that you have used, cited or quoted in order to complete this assessment.		

MODULE LEARNING

Outcome from this module:

1. Demonstrate a systematic understanding of the key elements that contribute to the successful gathering of market knowledge for the new product development.

TASK DESCRIPTION

Scenario Background

In this scenario You are NPD and Innovations Manager of a Carmarthenshire based SME which currently specialises in the manufacture of electronic breathalyser systems (See the website of Lion Laboratories for an exemplar product, for example the Lion Alcometer 500.)

A new product development project

Through a Knowledge Transfer Partnership with a local university, the Company identified an opportunity to extend the chemical alcohol detector system which is at the heart of their breathalyser products to cover the detection of other organic materials, including those generated in the breath as a result of various virus infections. The new system has been trialled successfully in the laboratory and the necessary patent applications have been registered.

In light of the current Coronavirus pandemic, the Company see great potential in developing a product that can meet both clinical and personal requirements for such virus detection and are therefore anxious to bring the new product to market as soon as possible.

However, the nature of the changes to the detector system is such that the existing breathalyser products cannot be employed as the basis for a new 'Virus Detect' product. Consequently, a completely new product design is required.

The Company have successfully prototyped the electronic and mechanical systems which form the new product and you have engaged a London-based company to design the 'physical envelope' and appearance of the new Virus Detector.

The company have decided to adopt a similar strategy to that which they use for their current range of breathalyser products, i.e. sourcing the electronics and mechanical elements of the product externally, and undertaking final assembly, testing, packing and shipping at the company's Carmarthen factory.

The Company CEO and Finance Director have jointly decided to seek alternative suppliers to those currently used, partly as a means of seeing if they might, as a result, be able to drive down the manufacturing costs of their existing products.

TASK DESCRIPTION cont'd

Project parameters and assumptions

For the purposes of this assessment you may assume that, on the basis of the prototype product testing, the company has already gained certification for the new virus detector from the various medical device regulatory agencies (In reality, this would be unlikely!).

The new product's electronics will be contained in a single circuit board. This will need to be sourced in a fully assembled and tested form.

The mechanical element of the detector (basically the breath sample capture system) will be fabricated from injection moulded parts. The Company have not yet decided whether to source this element as a fully assembled unit (as they do for their breathalyser products), or whether to source the mouldings separately and assemble the unit in house.

Preliminary research has indicated that China or Malaysia remains the most favourable source of electronic circuit boards - and that the UK or Europe would, for now, be seen as favoured source for the moulded parts.

The projected manufacturing volumes are 750,000 in the first year, and 3 million per annum afterwards.

The development of a Product Design Brief

As the NPD and Innovation Manager you're required to produce a Product Design Brief for all the company's managers; design & engineering, manufacture, finance, marketing, logistics etc.

The brief will outline what is required to bring the product into existence - and will inform the various managers within the company of the various touch points where their input or insight will be required or just appreciated.

The Brief you provide will have within it the following information.

1. A synopsis of the product and its potential as an NPD Project.
2. An analysis of the elements and architecture of the product that need to be considered.

N.B. Examples of the elements to be considered may well include (*not exclusive*) :

aesthetics	installation	performance	safety
branding	intellectual property	politics	size
company constraints	legal	processes	shelf life and storage
competition	life in service	prototyping	shipping
customer	materials	product cost	social & cultural
circular economy	manufacturing facilities	product life span	standards & specifications
documentation	market constraints	quality	testing
environment	maintenance & repair	quantity	time scale
ergonomics	packaging	reliability	weight

Module Code	ACPA6000
Title	Management of New Product Development
Date	26/08/2022
Level	6
Credits	20
Pre-Requisites	None

AIM(S)

- To evaluate the primary elements of the new product development process.
- To develop the knowledge, skills and expertise necessary to plan, implement and manage a successful product development process.

LEARNING OUTCOMES

Upon the successful completion of this module, the student should be able to:

- Systematically document and evaluate a detailed plan for an appropriate new product development process for a given product scenario.
- Make critical judgements on alternative approaches to new product development based on technological, strategic and financial / business considerations.
- Comprehensively understand the challenges inherent in incremental and disruptive new product development practices.

INDICATIVE CONTENT

- Knowledge acquisition and evaluation
- Business opportunity appraisal
- Product design specifications
- Distributive new product development
- Concept generation
- Prototyping and evaluation
- Technical and market testing
- Market introduction

Study Time Allocation

The study time for the module is divided as follows:

Activity type	Hours	Percentage
Scheduled learning	48	24%
Independent learning	152	76%
Placement learning	0	0%
TOTAL	200	100%

ASSESSMENT

Assessment Component 1

☐ Written exam
 ☒ Coursework
 ☐ Practical

Mode of assessment	Volume	Weighting
Written report	4,500 words	100%

Assessment Summary	
Activity type	Percentage
Written exam	0%
Coursework	100%
Practical	0%
TOTAL	100%

READING LIST

Module Code	ACPA6000	
Module Title	Management of New Product Development	
Classification	Reading List entry	Electronic*
Essential	Paul Trott (2012), <i>Innovation Management and New Product Development</i> , 5 th edition, London: Prentice Hall.	☒
Essential	Joe Tidd and John Bessant (2013), <i>Managing Innovation: Integrating Technological, Market and Organizational Change</i> , 5 th edition, Wiley. Online reference material: http://johnbessant.org/the-innovation-portal/	☐
Essential	Robert Cooper and Scott Edgett (2005) <i>Lean, Rapid and Profitable New Product Development</i> , Product Development Institute.	☐
Further	Peter Drucker (2012) <i>Innovation and Entrepreneurship</i> , Taylor and Francis.	☒
Further	Malcolm Goodman and Sandra Dingli (2013) <i>Creativity and Strategic Innovation Management</i> , New York: Routledge.	☒
Further	Journal of Product Innovation Management	☒
Further	Journal of Engineering and Technology Management	☒
Further	Technovation	☒
Further	Journal of Product and Brand Management	☒
Further	Production and Operations Management	☒

GUIDANCE FOR STUDENTS IN THE COMPLETION OF TASKS

NOTE: The guidance offered below is linked to the five generic assessment criteria overleaf.

1. Engagement with Literature Skills

Your work must be informed and supported by scholarly material that is *relevant* to and *focused* on the task(s) set; you should make use of scholarly reviews and primary sources, where appropriate (for example, refereed research articles and/or original materials appropriate to the discipline). You should provide evidence that you have accessed a wide *range* of sources, which may be academic, governmental and industrial; these sources may include academic journal articles, textbooks, current news articles, organisational documents, and websites. You should consider the *credibility* of your sources; academic journals are normally highly credible sources while websites require careful consideration/selection and should be used sparingly. Any sources you use should be current and up-to-date, mostly published within the last five years or so, though seminal/important works in the field may be older. You must provide *evidence* of your research/own reading throughout your work, using a suitable referencing system, including in-text citations in the main body of your work and a reference list at the end of your work.

Guidance specific to this assessment:

2. Knowledge and Understanding Skills

At level 6, you should be able to demonstrate coherent and detailed knowledge and a systematic understanding of the subject area, at least some of which is informed by the latest research and/or advanced scholarship within the discipline. You should be aware of the uncertainty, ambiguity and limits of knowledge. Your work must demonstrate the growing extent of your knowledge and systematic understanding of concepts and underlying principles associated with the subject area. *Knowledge* relates to the facts, information and skills you have acquired through your learning. You demonstrate your *understanding* by interpreting the meaning of the facts and information (knowledge). This means that you need to select and include in your work the concepts, techniques, models, theories, etc. appropriate to the task(s) set. You should be able to explain the theories, concepts, etc. meaningfully to show your understanding. Your mark/grade will also depend upon the *extent* to which you demonstrate your knowledge and understanding; ideally each should be complete and detailed, with comprehensive coverage.

Guidance specific to this assessment:

3. Cognitive and Intellectual Skills

You should be able to: critically evaluate evidence, arguments, assumptions, abstract concepts and data some of which are at the forefront of a discipline (and that may be incomplete) to devise and sustain arguments, to make judgements and/or solve problems; describe and comment upon particular aspects of current research, or equivalent advanced scholarship, in the discipline. Your work must contain evidence of logical, analytical thinking, evaluation and synthesis. For example, to examine and break information down into parts, make inferences, compile, compare and contrast information. This means not just describing what! But also justifying: Why? How? When? Who? Where? At what cost? At all times, you must provide justification for your arguments and judgements. Evidence that you have reflected upon the ideas of others within the subject area is crucial to you providing a reasoned and informed debate within your work. Furthermore, you should provide evidence that you are able to make sound judgements and convincing arguments using data and concepts. Sound, valid conclusions are necessary and must be derived from the content of your work. Where relevant, alternative solutions and recommendations may be proposed.

Guidance specific to this assessment:

4. Practical Skills

At level 6, you should be able to apply the methods and techniques that you have learned to review, consolidate, extend and apply your knowledge and understanding, and to initiate and carry out projects. You

will deploy accurately established techniques of analysis and enquiry relevant to the discipline, and apply them in complex and unpredictable contexts, to devise and sustain arguments and/or to solve problems. You should be able to frame appropriate questions to achieve a solution - or identify a range of solutions. You should be able to demonstrate how the subject-related concepts and ideas relate to real world situations and/or a particular context. How do they work in practice? You will deploy models, methods, techniques, and/or theories, in that context or circumstances, to assess current situations, perhaps to formulate plans or solutions to solve problems, or to create artefacts, some of which may be innovative and creative. This is likely to involve, for instance, the use of real world artefacts, examples and cases, the application of a model within an organisation and/or benchmarking one theory or organisation against others based on stated criteria. You should show awareness of the limitations of concepts and theories when applied in particular contexts.

Guidance specific to this assessment:

5. Transferable Skills for Life and Professional Practice

Your work must provide evidence of the qualities and transferable skills necessary for graduate-level employment requiring the exercise of initiative and personal responsibility and decision-making in complex and unpredictable circumstances. This includes demonstrating: the learning ability for professional development to advance existing skills and acquire new competences of a professional nature that will enable you to assume significant responsibility within organisations; that you can initiate and complete tasks and procedures, whether individually and/or collaboratively; that you can use appropriate media to effectively communicate information, arguments and analysis in a variety of forms to specialist and non-specialist audiences; fluency of expression; clarity and effectiveness in presentation and organisation. Work should be coherent and well-structured in presentation and organisation.

STUDENT FEEDBACK FORM

This section details the *extent* to which the assessment criteria are demonstrated by you, which in turn determines your mark. The marks available for each category of skill are shown. Lecturers will use the space provided to comment on the achievement of the task(s), including those areas in which you have performed well and areas that would benefit from development/improvement.

Generic Assessment Criteria	Marks available	Marks awarded
1. Engagement with Literature Skills		
2. Knowledge and Understanding Skills		
3. Cognitive and Intellectual Skills		
4. Practical Application Skills		
5. Transferable Skills for Life and Professional Practice		

Assessment Mark (Assessment marks are subject to ratification at the Exam Board. These comments and marks are to give feedback on module work and are for guidance only until they are confirmed.)	Late Submission Penalties (tick if appropriate)		%
	Up to 1 week late (40% Max)		
	Over 1 week late (0%)		

GENERIC ASSESSMENT CRITERIA

Level 6

In accordance with the Framework for Higher Education Qualifications, at the end of Level 6 students should have coherent and detailed knowledge and a systematic understanding of their subject area, at least some of which is informed by the latest research and/or advanced scholarship within the discipline. They will be able to accurately deploy established techniques of analysis and enquiry within a discipline, using their conceptual understanding to devise and sustain arguments and/or to solve problems. They should be aware of the uncertainty, ambiguity and limits of knowledge. They should be able to critically evaluate evidence, arguments, assumptions, abstract concepts and data (that may be incomplete), to make judgements, and to frame appropriate questions to achieve a solution - or identify a range of solutions. They will apply the methods and techniques that they have learned to review, consolidate, extend and apply their knowledge and understanding, and to initiate and carry out projects. They will have the ability to manage their own learning, and to make use of scholarly reviews and primary sources (for example, refereed research articles and/or original materials appropriate to the discipline). They will demonstrate the qualities and transferable skills necessary for employment requiring: the exercise of initiative and personal responsibility; decision-making in complex and unpredictable contexts; the learning ability needed to undertake appropriate further training of a professional or equivalent nature.

Level 6	FAIL	MARGINAL FAIL	SATISFACTORY (3 rd / Pass)	GOOD (2.2 / Pass)	VERY GOOD (2.1 / Merit)	EXCELLENT (1 st / Distinction)	EXCEPTIONAL (1 st / Distinction)
Category	0-29%	30-39%	40-49%	50-59%	60-69%	70-84%	85-100%
Engagement with literature (including reading, referencing, academic conventions and academic honesty)	Little or no evidence of reading and/or reliance on inappropriate sources. Views and findings mostly unsupported and non-authoritative. Referencing conventions used incoherently or largely absent.	Poor engagement with essential reading. No evidence of wider reading. Reliance on inappropriate sources, and/or indiscriminate use of sources. Heavily reliant on information gained through class contact. Inconsistent and weak use of referencing.	Engagement with a limited range of mostly relevant and credible sources. Some omissions and minor errors. Referencing conventions evident though not always applied accurately or consistently.	Engagement with an appropriate range of research-informed literature, including sources retrieved independently. Some over-reliance on texts. Referencing may show minor inaccuracies or inconsistencies.	Engagement with a wide range of research-informed literature, including sources retrieved independently. Selection of relevant and credible sources. Very good use of referencing, with no/very few inaccuracies or inconsistencies.	Engagement with an extensive range of relevant and credible literature, informed by the latest research. Consistently accurate application of referencing.	Exceptional engagement with an extensive range of relevant and credible literature, informed by the latest research. High-level referencing skills consistently and professionally applied.
Knowledge and understanding (Coherent and detailed)	Major gaps in knowledge and systematic understanding of the subject	Gaps in knowledge, with only superficial systematic understanding.	Limited knowledge and systematic understanding of the relevant	Knowledge is reasonably detailed, accurate with a good systematic	Knowledge is reasonably extensive coherent and detailed.	Excellent coherent and detailed knowledge and systematic	Exceptionally coherent and detailed knowledge and systematic

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Category	0-29%	30-39%	40-49%	50-59%	60-69%	70-84%	85-100%
knowledge and systematic understanding of the subject area, at least some of which is informed by the latest research and/or advanced scholarship within the discipline.)	matter. Substantial inaccuracies. No awareness of knowledge of the latest research and/or advanced scholarship within the discipline.	Some significant inaccuracies and/or irrelevant material. No awareness of knowledge of the latest research and/or advanced scholarship within the discipline.	concepts and principles within the subject area which to some limited extent, is informed by current research and scholarship.	understanding of the field of study and to some extent, current research and scholarship.	Exhibits very good understanding of the breadth and depth of established views, and the work is, at least in part, well-informed by current research and scholarship.	understanding of the principles and theories of current research and scholarship. Clear awareness of challenges to established views and the limitations of the knowledge base.	understanding of the principles and theories of the subject, well-informed by current research and scholarship. A critical, sophisticated and nuanced awareness of the ambiguities and limitations of knowledge.
Cognitive and intellectual skills (Conceptual and critical thinking, analysis, synthesis and evaluation of research, assumptions, abstract concepts and data (that may be incomplete); logic, argument and judgement.)	Wholly or almost wholly descriptive work. Little or no analysis, synthesis or evaluation. Failure to develop arguments, leading to illogical or invalid judgements. Unsubstantiated generalisations, made without use of any credible evidence.	Largely descriptive work, with superficial use of critical evaluation. Weak development of arguments and judgements. Information accepted uncritically, uses generalised statements made with scant evidence and unsubstantiated opinions. Ideas sometimes illogical and contradictory.	Limited attempt at critical thinking, analysis, synthesis and evaluation, tending towards description. Some evidence to support emerging arguments and judgements but these may be underdeveloped or with a little inconsistency / mis-interpretation. Asserts rather than argues a case.	Some critical thinking, analysis, synthesis and evaluation. Can analyse new and/or abstract concepts and data without guidance. An emerging awareness of different stances and ability to use evidence (that may be incomplete) to support the argument. Mostly valid arguments and logical judgements. Some tendency to assert/state opinion rather than argue on	Sound critical thinking, analysis, synthesis and evaluation demonstrating critical thinking. Ability to devise and sustain persuasive arguments, and to review the reliability, validity and significance of evidence (that may be incomplete) to make mostly appropriate and valid judgements.	Excellent critical thinking, analysis, synthesis and evaluation. Ability to investigate contradictory or incomplete information and make strong, persuasive, arguments and sophisticated judgements. Some evidence of independent thought and ability to 'see beyond the question', suggesting a grasp of the broader field and wider concepts.	Exceptional critical thinking, analysis, synthesis and evaluation based on judiciously selected evidence. Ability to investigate contradictory or incomplete information and make strong, persuasive, arguments and sophisticated, nuanced, judgements. Evidence of independent thought and ability to 'see beyond the question', suggesting an outstanding

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Category	0-29%	30-39%	40-49%	50-59%	60-69%	70-84%	85-100%
				the basis of reason and evidence.			grasp of the broader field and wider concepts.
Practical skills (Apply/deploy accurately established tools and techniques; initiate and carry out projects; formulate solutions to solve problems in complex and unpredictable contexts.)	Limited or no use of methods, materials, tools and/or techniques. Little or no appreciation of the context of the application. Limited understanding of the application of theory to practice or making appropriate links between the two. Very weak problem-solving skills in complex and unpredictable contexts.	Rudimentary application of methods, materials, tools and/or techniques but without consideration and competence. Flawed appreciation of the context of the application. Weak understanding of the application of theory to practice, with only occasional evidence of making appropriate links between the two. Weak problem-solving skills in complex and unpredictable contexts.	An adequate awareness and mostly appropriate application of well-established methods, materials, tools and/or techniques. Basic appreciation of the context of the application. Theoretical knowledge and understanding applied in practice, but not always making logical links between the two. Can identify problems and propose basic solutions in complex and unpredictable contexts without fully appreciating the complexity.	A good and appropriate application of standard methods, materials, tools and/or techniques. Clear appreciation of the context of the application. Mainly consistent, accurate and logical application of theory to practice, making appropriate links between the two. Can identify problems and propose mostly appropriate solutions in complex and unpredictable contexts.	A very good application of a range of methods, materials, tools and/or techniques. Very good consideration of the context of the application, with perceptive insights. Can identify problems and propose appropriate solutions in complex and unpredictable contexts. Evidence of some innovation and creativity.	An advanced application of a range of methods, materials, tools and/or techniques. The context of the application is well considered, and insightful. Application and deployment extend beyond established conventions. Can identify complex problems and propose excellent solutions. Innovation and creativity evident.	Exceptional levels of application and deployment skills in unpredictable, practical contexts, drawing skilfully on the latest research within the discipline. Can identify complex problems and propose sophisticated solutions. Assimilation and development of cutting edge processes and techniques.
Transferable skills for life and professional practice (Exercise of initiative and	Communication medium is inappropriate or misapplied. Work is poorly structured, disorganised	Communication medium is poorly designed and/or not suitable for the audience. Work is poorly presented in a	Can communicate in a suitable medium but with some room for improvement.	Can communicate effectively in a suitable format, but may have minor errors.	Can communicate well, confidently and consistently in a suitable format.	Can communicate professionally confidently and consistently in a suitable format.	Can communicate with an exceptionally high level of professionalism.

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Category	0-29%	30-39%	40-49%	50-59%	60-69%	70-84%	85-100%
personal responsibility; professional development; initiate and complete tasks and procedures: individually and/or collaboratively; use appropriate media to communicate effectively; fluency of expression; clarity and effectiveness in presentation and organisation.)	and/or confusingly expressed. Very weak use of language and/or very inappropriate style. Little or no evidence of autonomy (or collaboration, where relevant) in the completion of tasks. Little or no evidence of the skills required in graduate employment.	disjointed manner. It is loosely, and at times incoherently, structured, with information and ideas often poorly expressed. Weak use of language and/or inappropriate style. Weak independent initiative (or collaboration, if relevant). Limited evidence of the skills required in graduate employment.	Mostly ordered presentation and structure in which relevant ideas / concepts are reasonably expressed. Work may lack coherence in places. Can work as part of a team, but with limited involvement in group activities. Demonstrates the basic skills required in graduate employment, with some areas of minor weakness.	Mostly coherent, organised work, in a suitable structure and is for the most part clearly expressed. Can work effectively independently and/or as part of a team, with clear contribution to group activities. Demonstrates the skills required in graduate employment, with some areas of strength and some of minor weakness.	Work is coherent, fluent, well-structured and organised. Can work very well autonomously and/or as part of a team, with very good contribution to group activities. Demonstrates very good graduate employment skills, with just occasional minor weakness.	Work is coherent, very fluent and is presented professionally. Can work autonomously with initiative. Where relevant can work professionally within a team, showing leadership skills as appropriate, managing conflict and meeting obligations. Demonstrates excellent graduate employment skills and an appetite for further development.	Work is exceptionally coherent, very fluent and is presented professionally. Can work exceptionally well and professionally within a team, showing advanced leadership skills. Demonstrates exceptional graduate employment skills and an appetite for further development.