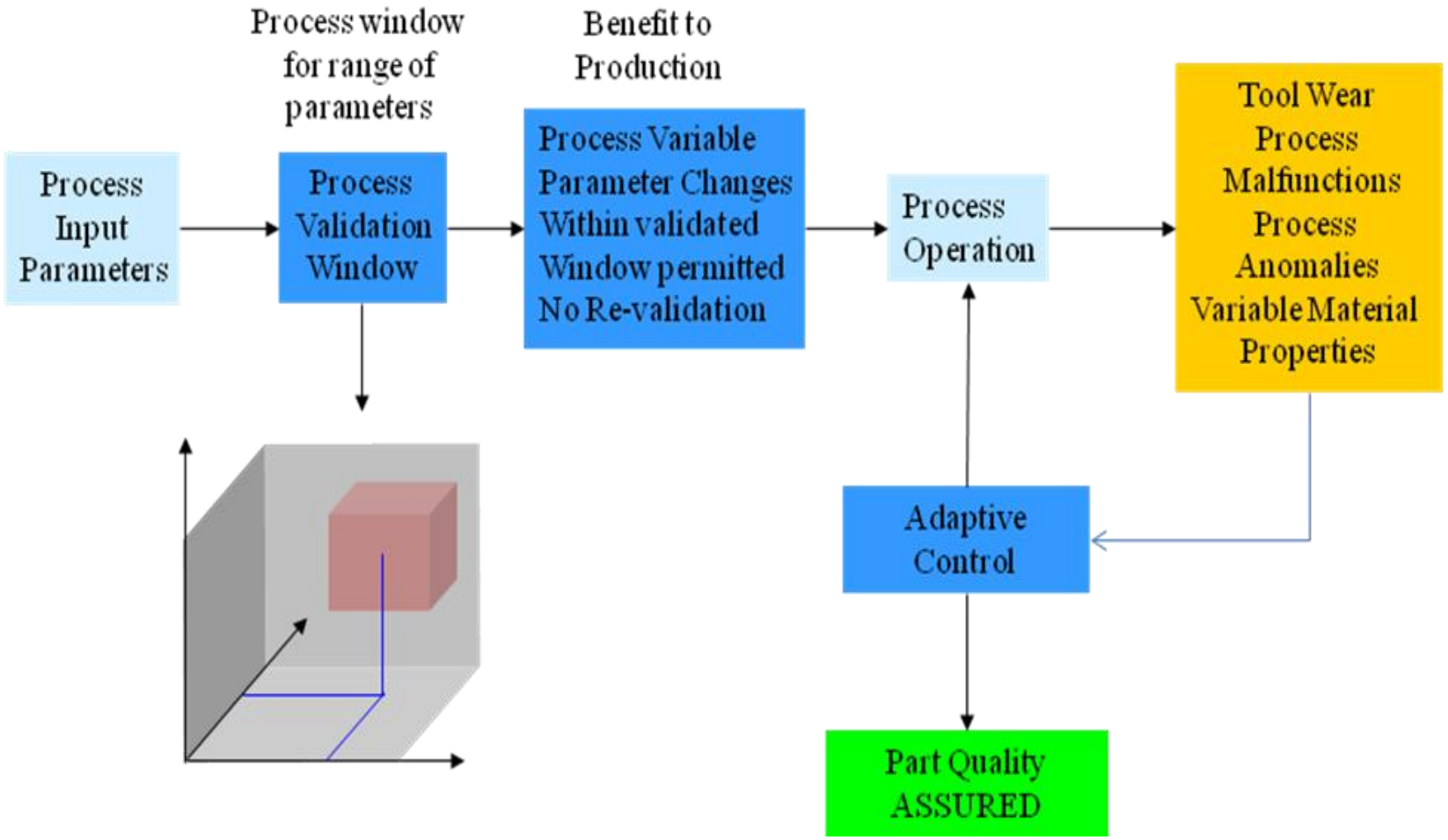
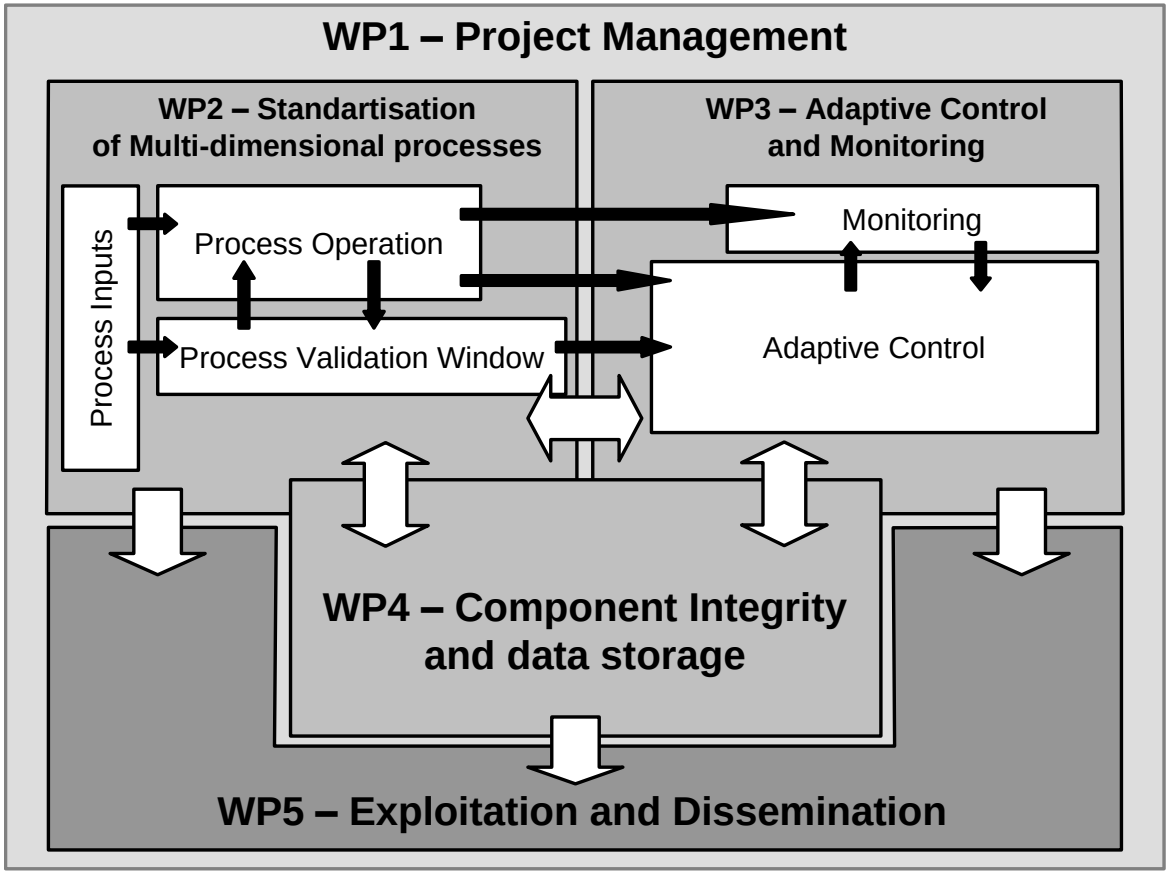
The ACCENT Concept



ACCENT Work Packages



Academic Progress Summary

Academic Partner	Main competences and recognition before ACCENT project	ACCENT technical and scientific field of new experience and progresses	Perspectives and complementary work after ACCENT project
Partner N°2: WZL	1) **system developments** for monitoring 2) **sensor development** for machining 3) construction of **adaptive control system** for machining	1) **Modelling** & **monitoring** of machining(**milling**) operation 2) Expertise on **broaching trials** and fundamental project	1) Use of practical and theoretical progresses on **other applications**
Partner N°9: ENIT	1) Influence of **static and dynamic machining system behaviour** on **surface and sub-surface characteristics** 2) **Chatter phenomena** and influence on **surface roughness** 3)**Titanium and nicke**l based alloys **machining**	1) hard material **behaviour in turning and hole-making** 2) hard material **surface integrity analysis** after **turning** and **hole-making** 3) hard material **process monitoring strategies** for **drilling** and **turning**	1) Complementary work on **Process Monitoring** for **turning** operation 2) Complementary work applied on **Titanium alloy machining** -2°Explore and study **influence of cutting aids on process monitoring strategies**
Partner N°10: ARTS	1) **Hard material/refractory alloys machining** 2) Influence of **cutting condition** on **tool wear** and **surface integrity** 3) Machining **process instrumentation** and **software development**	1) **Modelling** & **monitoring** of **milling** operation 2) Hard material **surface integrity analysis** after expertise on **turning** and **milling trials** 3) Adaptive Control Solution for Milling of Inconel718 with Principal Component Analysis 4) Hard material **process monitoring strategies** for **turning & milling** 5) Residual stress condition and measurement on milling of Inconel 718	1) Complementary work on **process Monitoring** for **milling & turning** operation with Principal Component Analysis to correlate process monitoring and residual stresses 2) Adapt the demonstrator for a real industrial environment 3°) Test the demonstrator for surface integrity process monitoring in a real industrial environment 4) Extend **research work** to other machining operations: especially **drilling (Inconel 718 and Titanium alloy Ti6242).**
Partner N°11: TUKE	1) **method and procedure** for machining **process monitoring** 2) ceramic and coated carbide insert **wear behaviour** 3) application of **statistical methods and neural networks** in **data processing**	1) machining of **titanium and nickel based alloys knowledge** 2) various **statistical analysis and data processing** applied **on experimental results** 3) area of **artificial neural network application** of **tool wear and surface roughness modelling** and **prediction for drilling, milling and turning operations**	1) Complementary **research work** on machining of **Ti-base material in turning and drilling** operations 2) development of **ANN applications for decision making process** in **monitoring system for drilling**
Partner N°12: MGEP	1) **machining** of hard to cut material (**Inco718, titanium alloys**) 2) **process monitoring** of machining and **chip formation modelling**	1) knowledge on **turning of inconel** based on **surface integrity data** 2) **process monitoring strategies** for **turning of Inconel** operations	1) extend **research work** to other machining operations: **drilling, broaching for Inconel 718 and Titanium alloys (Ti64, Ti6242).**
Partner N°14: UNINA	1) Micro and macro **machining processes** 2) **Sensors and signal analysis** for **intelligent monitoring systems** 3) **Material characterization** through non destructive & destructive methods 4) **Cognitive paradigms** for **manufacturing** and **materials engineering**	1) **turning of Inconel718** knowledge 2) **multiple sensors system** for **monitoring** of **turning** knowledge 3) **tool wear detection and measurement** for **turning of inconel718** operation 4) **residual stress condition and measurement** on **turning of Inconel 718.**	1) develop **multi sensor monitoring system approach** in a real industrial environment.

Industrial Progress Summary

Industrial Partner	Process Monitoring use into shop floor		Machining specification with process monitoring requirements		Process monitoring signal and surface integrity defect demonstrated correlations	
	Before ACCENT	**After ACCENT**	**Before ACCENT**	**After ACCENT**	**Before ACCENT**	**After ACCENT**
Partner N°1: RR	Mandated on high L/D ratio hole-making operations on critical parts	Mandated on high L/D ratio hole-making operations on critical parts	Limited to specific machines	PM section in global machine tool specification	Limited to gross process malfunction in hole-making operations	Being investigated for other processes
Partner N°3: MTU	On critical parts (other OEM part) : - Hole-making	Drilling, milling, Broaching of new design parts	-	MTU specifications for Drilling, Milling, Broaching	-	Hole-Making & Broaching
Partner N°4: AVIO	Hole-Making	Hole-Making Broaching	No process monitoring specification	No process monitoring specification	-	Broaching and Turning Inco718
Partner N°5: SNECMA	On critical parts : - Hole-making	On critical parts : - Hole-making - Turning (specific operations)	On critical parts - Hole-making	On critical parts - Hole-making - Turning (specific operations)	-Hole-making Inco718	-Hole-making Inco718 -Turning Ti64 -Milling Inco718
Partner N°6: VOLVO	- Hole-making	- Hole-making - Broaching (tool life) - Turning (coolant only)	- Hole-making	- Hole-making	-	Inco 718 Waspaloy
Partner N°7: ITP	On critical parts - Holes	Holes for critical and no critical parts	On critical parts - Holes	Holes for critical and no critical parts Specification for turning trials to define acceptable surface domain	Holes In718	Turning Inco718
Partner N°8: TM	- Tool life on broaching	On critical part - Hole-making - Tool life on broaching	No process monitoring specification	Specification update in progress	-Hole-making Inco718	-Hole-making Inco718 -Hole-making U720 -Turning U720
Partner N°13: APR	-	Planned for incoming critical jobs on: - Inco718 milling - Stainless steel deep hole drilling	-	Planned upon more systemic data collection	-	Planned upon more systemic data collection